SYLVANIA

SERVICE MANUAL

20″ PURE FLAT
COLOR TV/DVD

CD202SL8

IMPORTANT SAFETY NOTICE

Proper service and repair is important to the safe, reliable operation of all Funai Equipment. The service procedures recommended by Funai and described in this service manual are effective methods of performing service operations. Some of these service special tools should be used when and as recommended.

It is important to note that this service manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Funai could not possibly know, evaluate and advice the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Funai has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Funai must first use all precautions thoroughly so that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

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SPECIFICATIONS

✳Test input terminal
<Except Tuner>----------Video input (1Vp-p)
Audio input (-10dB)
<Tuner>----------Ant. input (80dBμV) Video: 87.5%
Audio: 25kHz dev (1kHz Sin)

< DEFLECTION >

Description	Condition	Unit	Nominal	Limit
1. Over Scan	Horizontal	%	10	10±5
	Vertical	%	10	10±5
2. Linearity	Horizontal	%	---	±18
	Vertical	%	---	±10
3. High Voltage	---	kV	25.5	---

< VIDEO & CHROMA >

Description	Condition	Unit	Nominal	Limit
1. Misconvergence	Center	m/m	---	0.4
	Corner	m/m	---	2.5
	Side	m/m	---	1.5
2. Tint Control Range	---	deg	±30	---
3. Contrast Control Range	---	dB	6	2
4. Brightness (100% White Full Field)	Contrast: Max	ft-L	28	24
5. Color Temperature	---	°K	9200	---

< DVD > Measurement at Joint PCB R9747, R9748 (Audio) and Loader PCB CN2-6pin, 8pin (Video)

Description		Condition	Unit	Nominal	Limit
1. Horizontal Resolution (TDV-540 TIT.2 CHP.16)		---	Line	350	330
2. Video S/N (TDV-540 TIT.2 CHP.6)		---	dB	60	55
3. S/N Chroma (TDV-540 TIT.2 CHP.17)	AM	---	dB	58	53
	PM	---	dB	58	53
4. Audio Distortion (LPCM 48 kHz, W/LPF) (PTD 1-NOR TIT.1 CHP.1)		Lch	%	0.03	0.07
		Rch			
5. Audio freq. response (LPCM 48 kHz) (PTD 1-NOR TIT.1 CHP.1, 5, 10)		L, Rch: 20 Hz	dB	0	+4/-5
		L, Rch: 20 kHz			
6. Audio S/N (LPCM 48 kHz, W/LPF, A-WTD) (PTD 1-NOR TIT.1 CHP.1, 2)		Lch	dB	85	75
		Rch			

< TUNER > Measurement at Speaker (Audio), R1016 (Video)

Description	Condition	Unit	Nominal	Limit
1. Video S/N (80dBμV, TV4ch)	---	dB	45	40
2. Audio S/N (W/LPF, 15 kHz dev.)	---	dB	45	40
3. Audio Output Power (at 10% distortion, 25 kHz dev.)	---	W	1	0.8

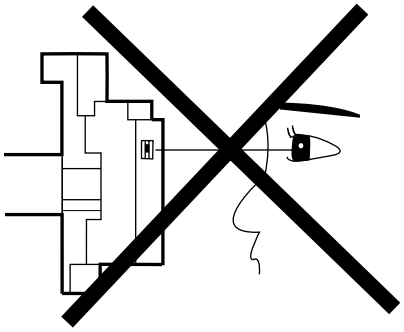
< ATSC > Measurement at Speaker (Audio)

Description	Condition	Unit	Nominal	Limit
1. RECEIVED FREQ. RANGE (-28dBm)	+	kHz	150	>100
	–			
2. ATSC DYNAMIC RANGE (min./max.)	VHF LOW BAND. CH.4	dBμV	26/114	32/108
	VHF HI BAND. CH.10		26/114	32/108
	UHF BAND. CH.41		28/118	34/112
3. ATSC SUSCEPTIBILITY TO RANDOM NOISE	VHF LOW BAND. CH.4	dB	20	<26
	VHF HI BAND. CH.10			
	UHF BAND. CH.41			
4. NTSC CO-CHANNEL INTERFERENCE	VHF LOW BAND. CH.4	dB	0	>-6
	VHF HI BAND. CH.10			
	UHF BAND. CH.41			
5. MULTIPATH	A	dB	0	<6
	B			
	C			
	D			
	E			
	F			
	FF			
	G			
6. Audio S/N (0dBfs)	Lch	dB	60	>50
	Rch			
7. Audio DIST. (0dBfs)	Lch	%	0.1	<3
	Rch			

Note: Nominal specifications represent the design specifications. All units should be able to approximate these. Some will exceed and some may drop slightly below these specifications. Limit specifications represent the absolute worst condition that still might be considered acceptable. In no case should a unit fail to meet limit specifications.

LASER BEAM SAFETY PRECAUTIONS

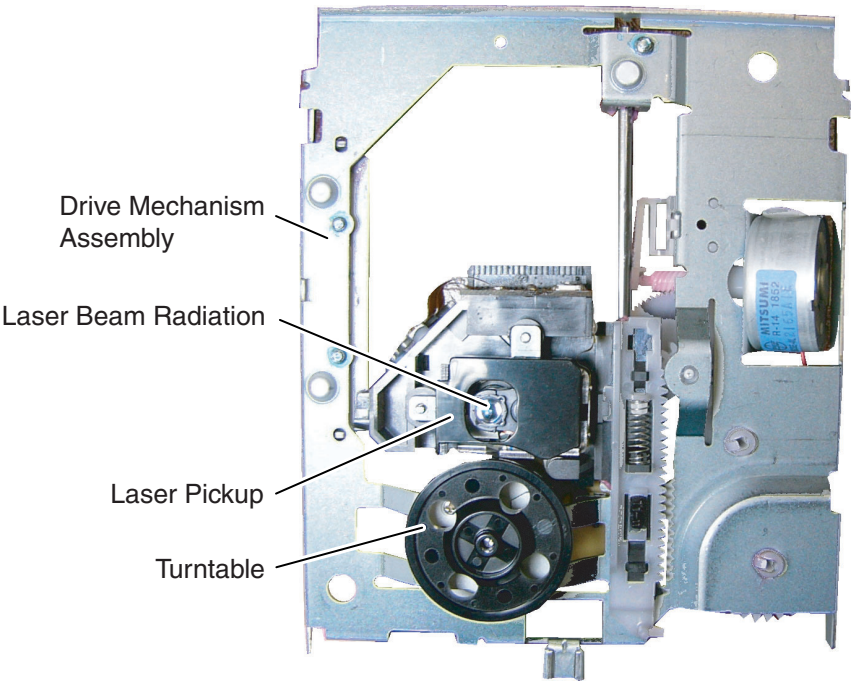
This DVD player uses a pickup that emits a laser beam.



Do not look directly at the laser beam coming from the pickup or allow it to strike against your skin.

The laser beam is emitted from the location shown in the figure. When checking the laser diode, be sure to keep your eyes at least 30 cm away from the pickup lens when the diode is turned on. Do not look directly at the laser beam.

CAUTION: Use of controls and adjustments, or doing procedures other than those specified herein, may result in hazardous radiation exposure.



CAUTION
LASER RADIATION
WHEN OPEN. DO NOT
STARE INTO BEAM.

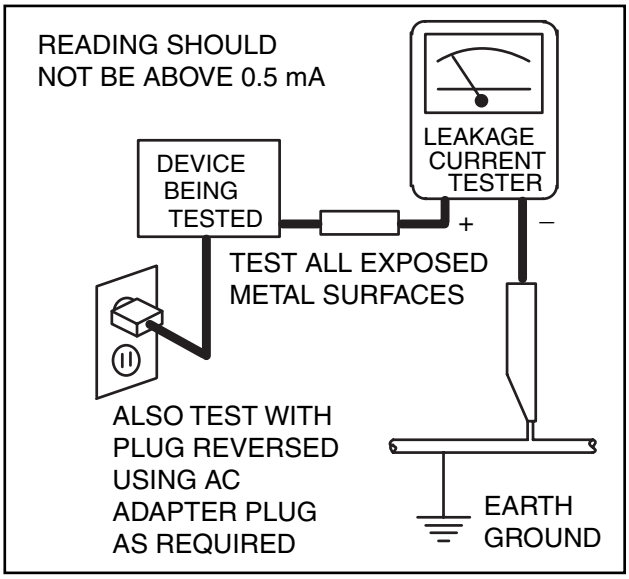
Location: Top of DVD mechanism.

IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, our products are strictly inspected for recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

Safety Precautions for TV Circuit

1. **Before returning an instrument to the customer,** always make a safety check of the entire instrument, including, but not limited to, the following items:
   - **a.** Be sure that no built-in protective devices are defective and have been defeated during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. **Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning. Servicers who defeat safety features or fail to perform safety checks may be liable for any resulting damage.**
   - **b.** Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, (1) spacing between the picture tube and the cabinet mask, (2) excessively wide cabinet ventilation slots, and (3) an improperly fitted and/or incorrectly secured cabinet back cover.
   - **c. Antenna Cold Check -** With the instrument AC plug removed from any AC source, connect an electrical jumper across the two AC plug prongs. Place the instrument AC switch in the on position. Connect one lead of an ohmmeter to the AC plug prongs tied together and touch the other ohmmeter lead in turn to each tuner antenna input exposed terminal screw and, if applicable, to the coaxial connector. If the measured resistance is less than 1.0 megohm or greater than 5.2 megohm, an abnormality exists that must be corrected before the instrument is returned to the customer. Repeat this test with the instrument AC switch in the off position.
   - **d. Leakage Current Hot Check -** With the instrument completely reassembled, plug the AC line cord directly into a 120 V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1410, (50.7). With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinet, screw heads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milli-ampere. Reverse the instrument power cord plug in the outlet and repeat the test.



ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER OR BEFORE CONNECTING THE ANTENNA OR ACCESSORIES.

- **e. X-Radiation and High Voltage Limits -** Because the picture tube is the primary potential source of X-radiation in solid-state TV receivers, it is specially constructed to prohibit X-radiation emissions. For continued X-radiation protection, the replacement picture tube must be the same type as the original.

Also, because the picture tube shields and mounting hardware perform an X-radiation protection function, they must be correctly in place. High voltage must be measured each time servicing is performed that involves B+, horizontal deflection or high voltage. Correct operation of the X-radiation protection circuits also must be reconfirmed each time they are serviced. (X-radiation protection circuits also may be called “horizontal disable” or “hold down.”) Read and apply the high voltage limits and, if the chassis is so equipped, the X-radiation protection circuit specifications given on instrument labels and in the Product Safety & X-Radiation Warning note on the service data chassis schematic. High voltage is maintained within specified limits by close tolerance safety-related components/ adjustments in the high-voltage circuit. If high voltage exceeds specified limits, check each component specified on the chassis schematic and take corrective action.

2. Read and comply with all caution and safety-related notes on or inside the receiver cabinet, on the receiver chassis, or on the picture tube.
3. **Design Alteration Warning -** Do not alter or add to the mechanical or electrical design of this TV receiver. Design alterations and additions, including, but not limited to circuit modifications and the addition of items such as auxiliary audio and/or video output connections, might alter the safety characteristics of this receiver and create a hazard to the user. Any design alterations or additions will void the manufacturer's warranty and may make you, the servicer, responsible for personal injury or property damage resulting therefrom.
4. **Picture Tube Implosion Protection Warning -** The picture tube in this receiver employs integral implosion protection. For continued implosion protection, replace the picture tube only with one of the same type number. Do not remove, install, or otherwise handle the picture tube in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while picture tubes are handled. Keep the picture tube away from your body. Do not handle the picture tube by its neck. Some “in-line” picture tubes are equipped with a permanently attached deflection yoke; because of potential hazard, do not try to remove such “permanently attached” yokes from the picture tube.
5. **Hot Chassis Warning -**
   a. Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord and maybe safety-serviced without an isolation transformer only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC power source. To confirm that the AC power plug is inserted correctly, with an AC voltmeter, measure between the chassis and a known earth ground. If a voltage reading in excess of 1.0V is obtained, remove and reinsert the AC power plug in the opposite polarity and again measure the voltage potential between the chassis and a known earth ground.
   b. Some TV receiver chassis normally have 85V AC(RMS) between chassis and earth ground regardless of the AC plug polarity. This chassis can be safety-serviced only with an isolation transformer inserted in the power line between the receiver and the AC power source, for both personnel and test equipment protection.
   c. Some TV receiver chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is not isolated from the AC power line. The two ground systems are electrically separated by insulation material that must not be defeated or altered.
6. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: a. near sharp edges, b. near thermally hot parts-be sure that leads and components do not touch thermally hot parts, c. the AC supply, d. high voltage, and, e. antenna wiring. Always inspect in all areas for pinched, out of place, or frayed wiring. Check AC power cord for damage.
7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.
8. **Product Safety Notice -** Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by a ⚠ on schematics and in parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. The product's safety is under review continuously and new instructions are issued whenever appropriate. Prior to shipment from the factory, our products are strictly inspected to confirm they comply with the recognized product safety and electrical codes

of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

Precautions during Servicing

A. Parts identified by the ⚠ symbol are critical for safety.
Replace only with part number specified.

B. In addition to safety, other parts and assemblies are specified for conformance with regulations applying to spurious radiation. These must also be replaced only with specified replacements.
Examples: RF converters, RF cables, noise blocking capacitors, and noise blocking filters, etc.

C. Use specified internal wiring. Note especially:

1) Wires covered with PVC tubing
2) Double insulated wires
3) High voltage leads

D. Use specified insulating materials for hazardous live parts. Note especially:

1) Insulation Tape
2) PVC tubing
3) Spacers
4) Insulators for transistors.

E. When replacing AC primary side components (transformers, power cord, etc.), wrap ends of wires securely about the terminals before soldering.

F. Observe that the wires do not contact heat producing parts (heat sinks, oxide metal film resistors, fusible resistors, etc.)

G. Check that replaced wires do not contact sharp edged or pointed parts.

H. When a power cord has been replaced, check that 5~6 kg of force in any direction will not loosen it.

I. Also check areas surrounding repaired locations.

J. Be careful that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

K. When connecting or disconnecting the DVD/VCR connectors, first, disconnect the AC plug from the AC supply socket.

Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Clearance Distance

When replacing primary circuit components, confirm specified clearance distance (d) and (d') between soldered terminals, and between terminals and surrounding metallic parts. (See Fig. 1)

Table 1: Ratings for selected area

AC Line Voltage	Region	Clearance Distance (d), (d')
110 to 130 V	U.S.A. or Canada	≥ 3.2 mm (0.126 inches)

Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

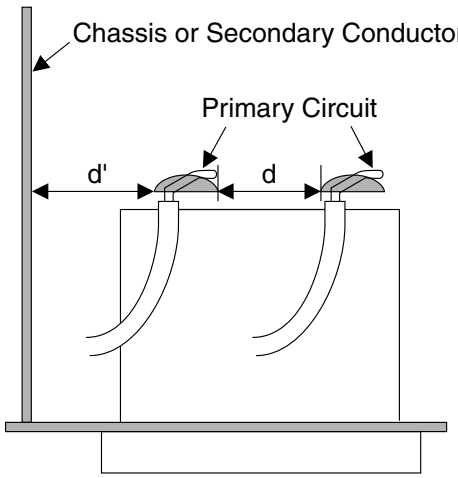


Fig. 1

2. Leakage Current Test

Confirm the specified (or lower) leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See Fig. 2 and following table.

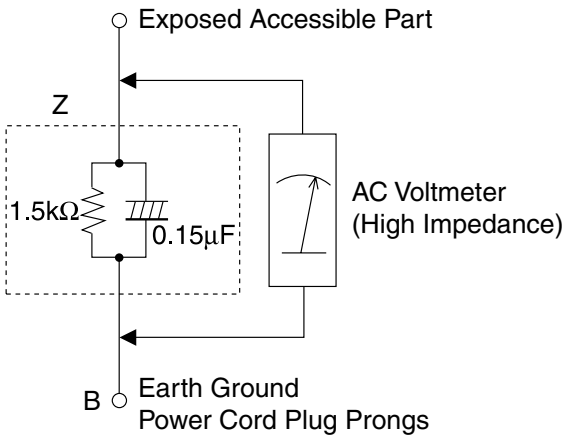


Fig. 2

Table 2: Leakage current ratings for selected areas

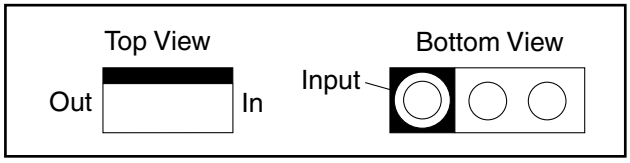
AC Line Voltage	Region	Load Z	Leakage Current (i)	Earth Ground (B) to:
110 to 130 V	U.S.A. or Canada	0.15 μF CAP. & 1.5 kΩ RES. Connected in parallel	i ≤ 0.5 mA rms	Exposed accessible parts

Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

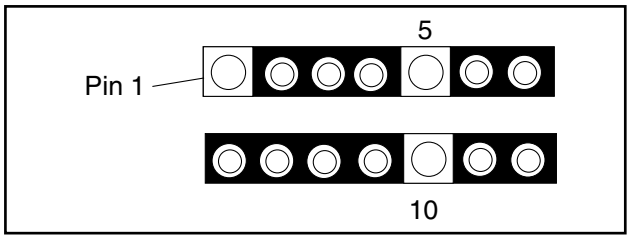
STANDARD NOTES FOR SERVICING

Circuit Board Indications

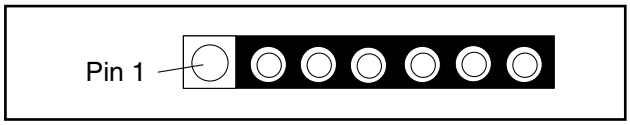
1. The output pin of the 3 pin Regulator ICs is indicated as shown.



2. For other ICs, pin 1 and every fifth pin are indicated as shown.

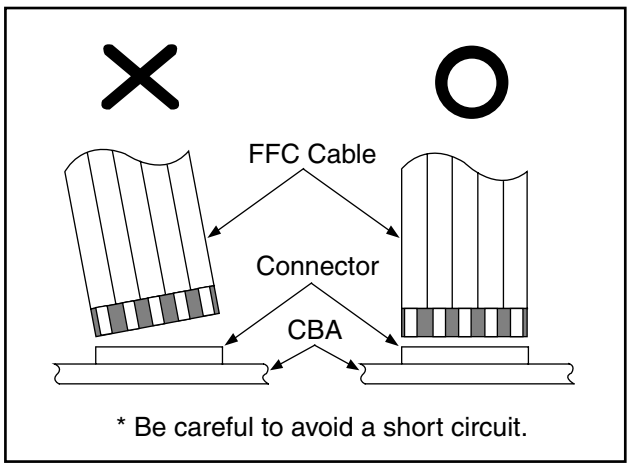


3. The 1st pin of every male connector is indicated as shown.



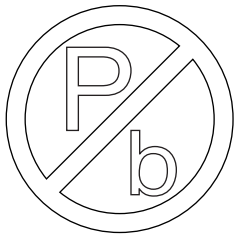
Instructions for Connectors

1. When you connect or disconnect the FFC (Flexible Foil Connector) cable, be sure to first disconnect the AC cord.
2. FFC (Flexible Foil Connector) cable should be inserted parallel into the connector, not at an angle.



Pb (Lead) Free Solder

Pb free mark will be found on PCBs which use Pb free solder. (Refer to figure.) For PCBs with Pb free mark, be sure to use Pb free solder. For PCBs without Pb free mark, use standard solder.



Pb free mark

How to Remove / Install Flat Pack-IC

1. Removal

With Hot-Air Flat Pack-IC Desoldering Machine:

1. Prepare the hot-air flat pack-IC desoldering machine, then apply hot air to the Flat Pack-IC (about 5 to 6 seconds). (Fig. S-1-1)

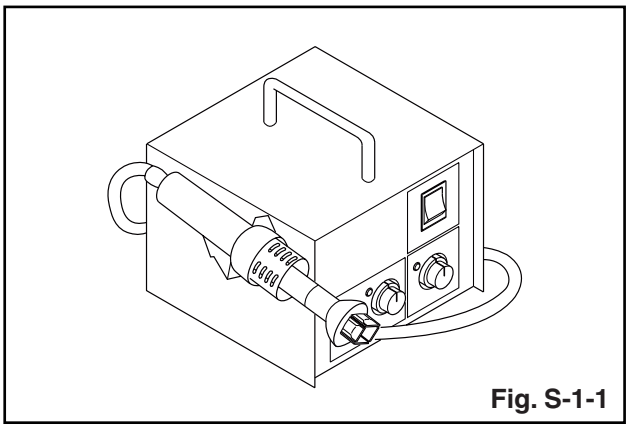


Fig. S-1-1

2. Remove the flat pack-IC with tweezers while applying the hot air.
3. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

CAUTION:

1. The Flat Pack-IC shape may differ by models. Use an appropriate hot-air flat pack-IC desoldering machine, whose shape matches that of the Flat Pack-IC.
2. Do not supply hot air to the chip parts around the flat pack-IC for over 6 seconds because damage to the chip parts may occur. Put masking tape

around the flat pack-IC to protect other parts from damage. (Fig. S-1-2)

3. The flat pack-IC on the CBA is affixed with glue, so be careful not to break or damage the foil of each pin or the solder lands under the IC when removing it.

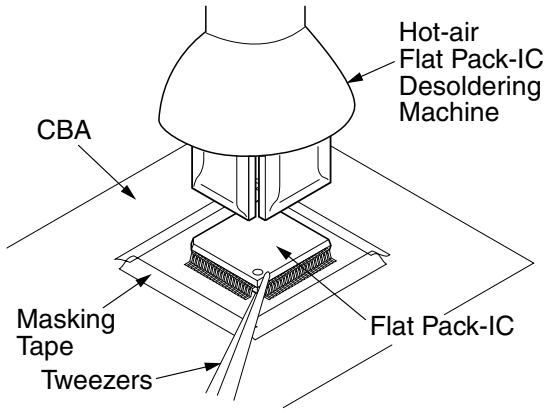


Fig. S-1-2

With Soldering Iron:

1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)

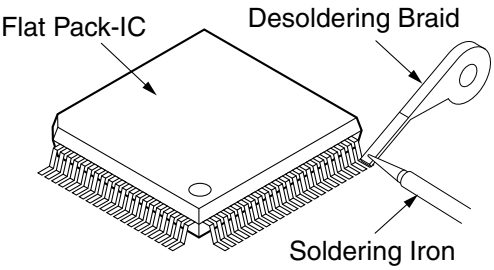


Fig. S-1-3

2. Lift each lead of the flat pack-IC upward one by one, using a sharp pin or wire to which solder will not adhere (iron wire). When heating the pins, use a fine tip soldering iron or a hot air desoldering machine. (Fig. S-1-4)

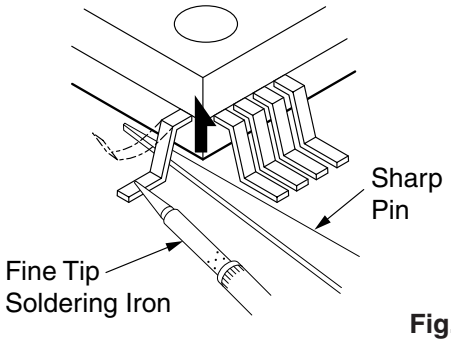


Fig. S-1-4

3. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

With Iron Wire:

1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)
2. Affix the wire to a workbench or solid mounting point, as shown in Fig. S-1-5.
3. While heating the pins using a fine tip soldering iron or hot air blower, pull up the wire as the solder melts so as to lift the IC leads from the CBA contact pads as shown in Fig. S-1-5.
4. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
5. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

Note: When using a soldering iron, care must be taken to ensure that the flat pack-IC is not being held by glue. When the flat pack-IC is removed from the CBA, handle it gently because it may be damaged if force is applied.

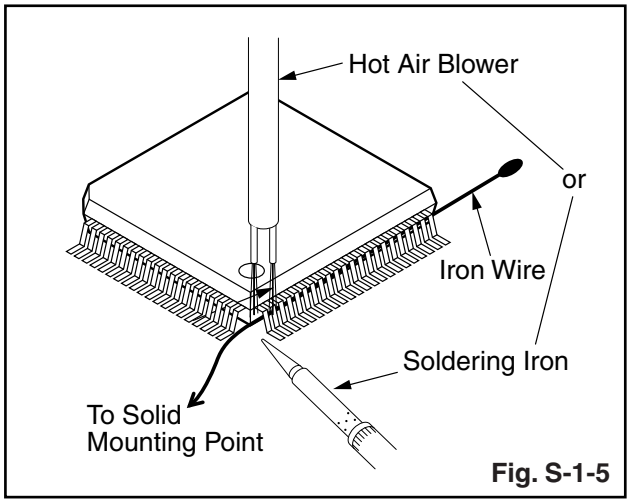


Fig. S-1-5

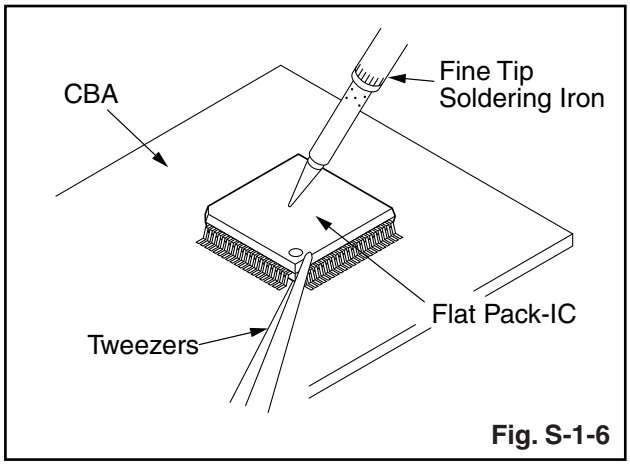


Fig. S-1-6

2. Installation

1. Using desoldering braid, remove the solder from the foil of each pin of the flat pack-IC on the CBA so you can install a replacement flat pack-IC more easily.
2. The "●" mark on the flat pack-IC indicates pin 1. (See Fig. S-1-7.) Be sure this mark matches the 1 on the PCB when positioning for installation. Then presolder the four corners of the flat pack-IC. (See Fig. S-1-8.)
3. Solder all pins of the flat pack-IC. Be sure that none of the pins have solder bridges.

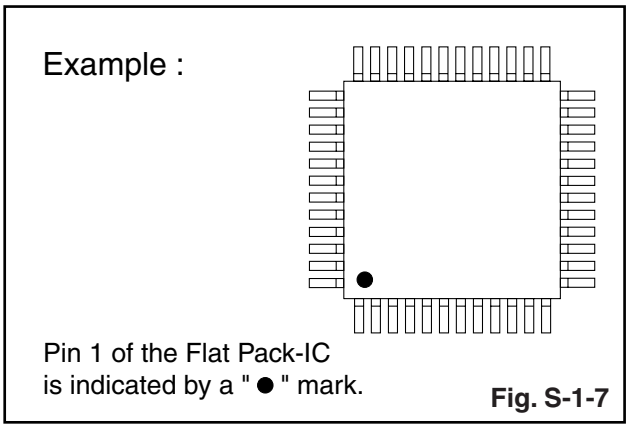


Fig. S-1-7

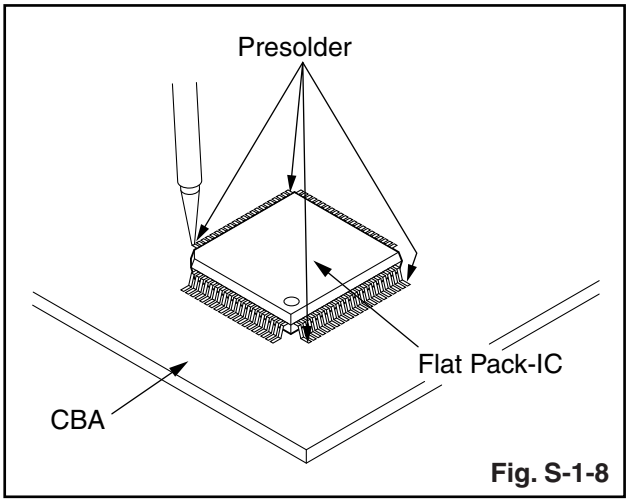


Fig. S-1-8

Instructions for Handling Semi-conductors

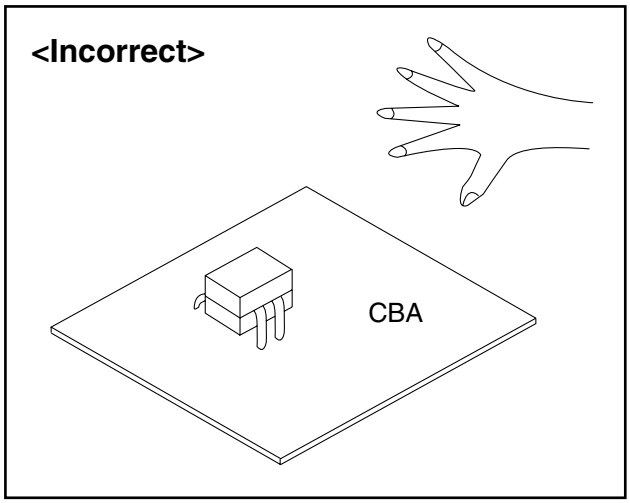
Electrostatic breakdown of the semi-conductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

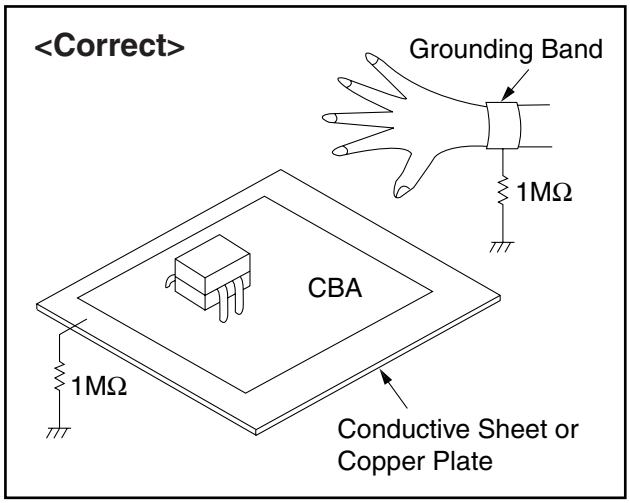
1. Ground for Human Body

Be sure to wear a grounding band (1 MΩ) that is properly grounded to remove any static electricity that may be charged on the body.

2. Ground for Workbench

Be sure to place a conductive sheet or copper plate with proper grounding (1 MΩ) on the workbench or other surface, where the semi-conductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting semi-conductors with your clothing.





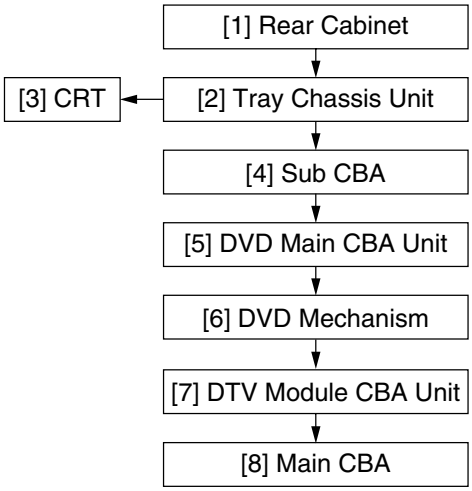
CABINET DISASSEMBLY INSTRUCTIONS

1. Disassembly Flowchart

This flowchart indicates the disassembly steps for the cabinet parts, and the CBA in order to gain access to item(s) to be serviced. When reassembling, follow the steps in reverse order. Bend, route and dress the cables as they were.

CAUTION!

When removing the CRT, be sure to discharge the Anode Lead of the CRT with the CRT Ground Wire before removing the Anode Cap.



2. Disassembly Method

ID/ LOC. No.	PART	REMOVAL		
		Fig. No.	REMOVE/ *UNHOOK/UNLOCK/ RELEASE/UNPLUG/ DESOLDER	Note
[1]	Rear Cabinet	D1	6(S-1), (S-2), 2(S-3)	-
[2]	Tray Chassis Unit	D2 D3 D5	Anode Cap, *CN2801, *CN2802, *CN2505, CRT CBA, *CN601, *CN1571	1
[3]	CRT	D2	4(S-4)	-
[4]	Sub CBA	D3 D5	*CN001, *CN002, *CN1101, *CN1102	-
[5]	DVD Main CBA Unit	D3 D4 D5	2(S-5), *CN201, *CN301	2-1 2-2 3
[6]	DVD Mechanism	D3 D4	4(S-6)	2-1 2-2 3
[7]	DTV Module CBA Unit	D3 D5	*CN1001, *CN1002, Module PCB Holder	-
[8]	Main CBA	D3	3(S-7)	-
		(3)	(4)	(5)

NOTES

(1): Order of steps in Procedure. When reassembling, follow the steps in reverse order.These numbers are also used as the Identification (location) No. of parts in Figures.

(2): Parts to be removed or installed.

(3): Fig. No. showing Procedure of Part Location.

(4): Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.
S=Screw, P=Spring, L=Locking Tab, CN=Connector, *=Unhook, Unlock, Release, Unplug, or Desolder
2(S-2) = two Screws (S-2)

(5): Refer to the following "Reference Notes in the Table."

Reference Notes in the Table

CAUTION !

When removing the CRT, be sure to discharge the Anode Lead of the CRT with the CRT Ground Wire before removing the Anode Cap.

CAUTION 1: Discharge the Anode Lead of the CRT with the CRT Ground Wire before removing the Anode Cap.

1. Disconnect the following: Anode Cap, CN2801, CN2505, CRT CBA, CN601 and CN1571. Then remove Tray Chassis Unit.

CAUTION 2: Electrostatic breakdown of the laser diode in the optical system block may occur as a potential difference caused by electrostatic charge accumulated on cloth, human body etc., during unpacking or repair work.

To avoid damage of pickup, follow the next procedures.

2-1. Short the three short lands of the FPC cable with solder before removing the FFC cable (CN201). If you disconnect the FFC cable (CN201) without shorting them, the laser diode of pickup will be destroyed. (Fig. D4)

2-2. Disconnect Connector (CN301) on the DVD Main CBA Unit.

CAUTION 3: When reassembling, confirm the FFC cable (CN201) is connected completely. Then remove the solder from the three short lands of the FPC cable. (Fig. D4)

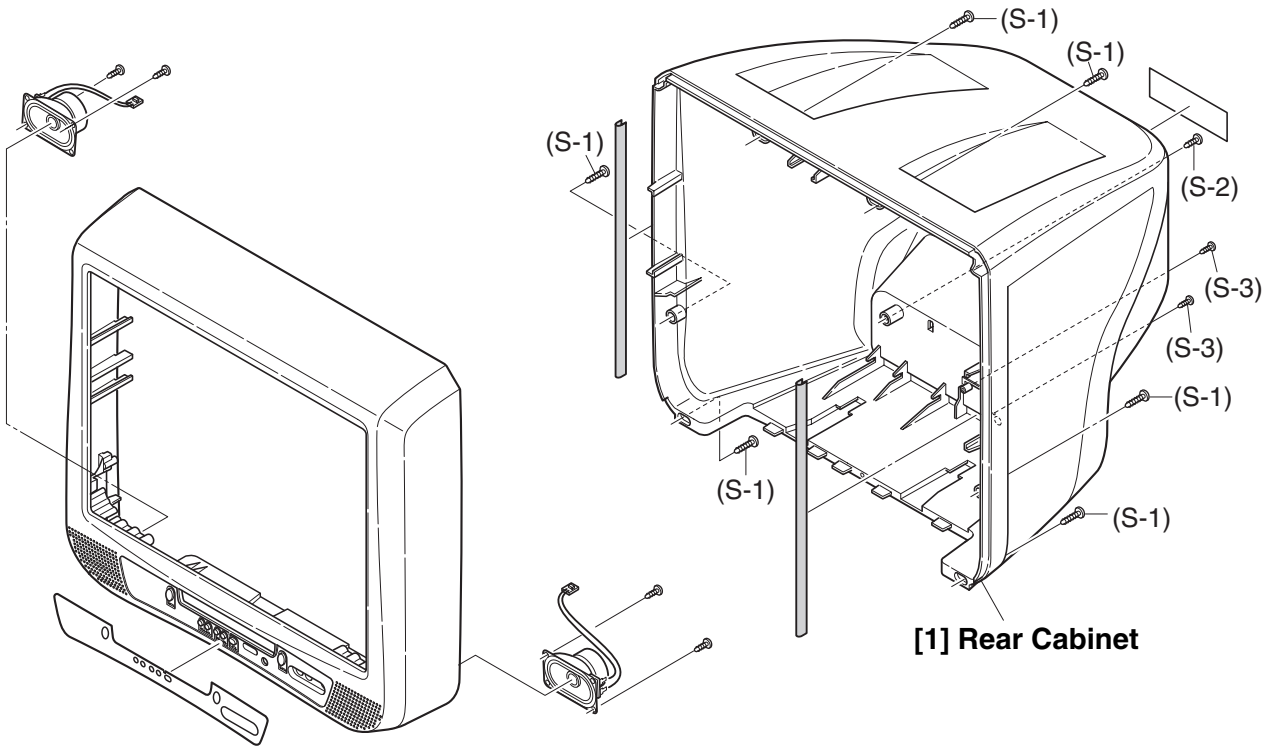

(S-1)
(S-1)
(S-1)
(S-2)
(S-3)
(S-3)
(S-1)
(S-1)
(S-1)
[1] Rear Cabinet

Fig. D1

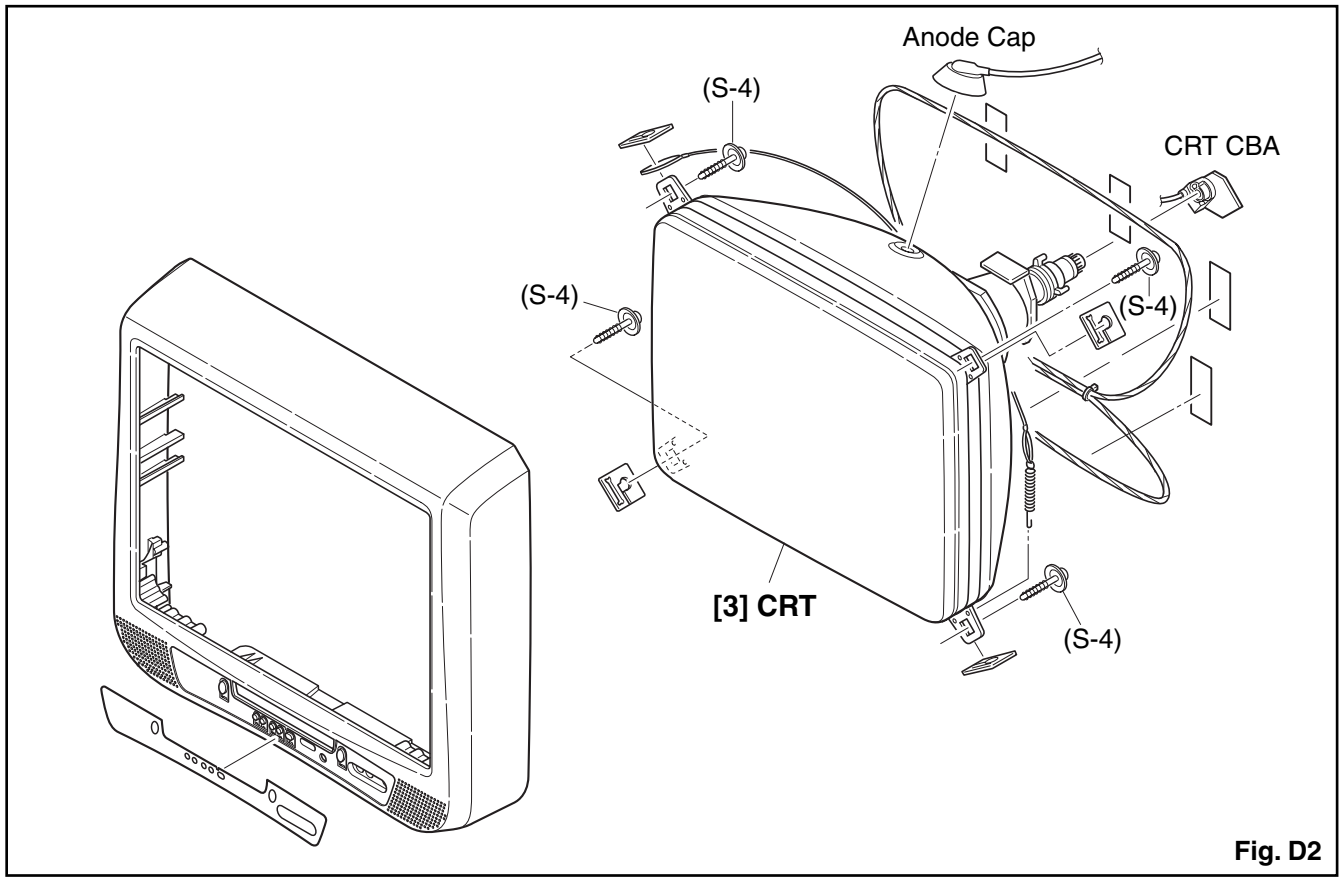

Anode Cap
(S-4)
CRT CBA
(S-4)
(S-4)
[3] CRT
(S-4)

Fig. D2

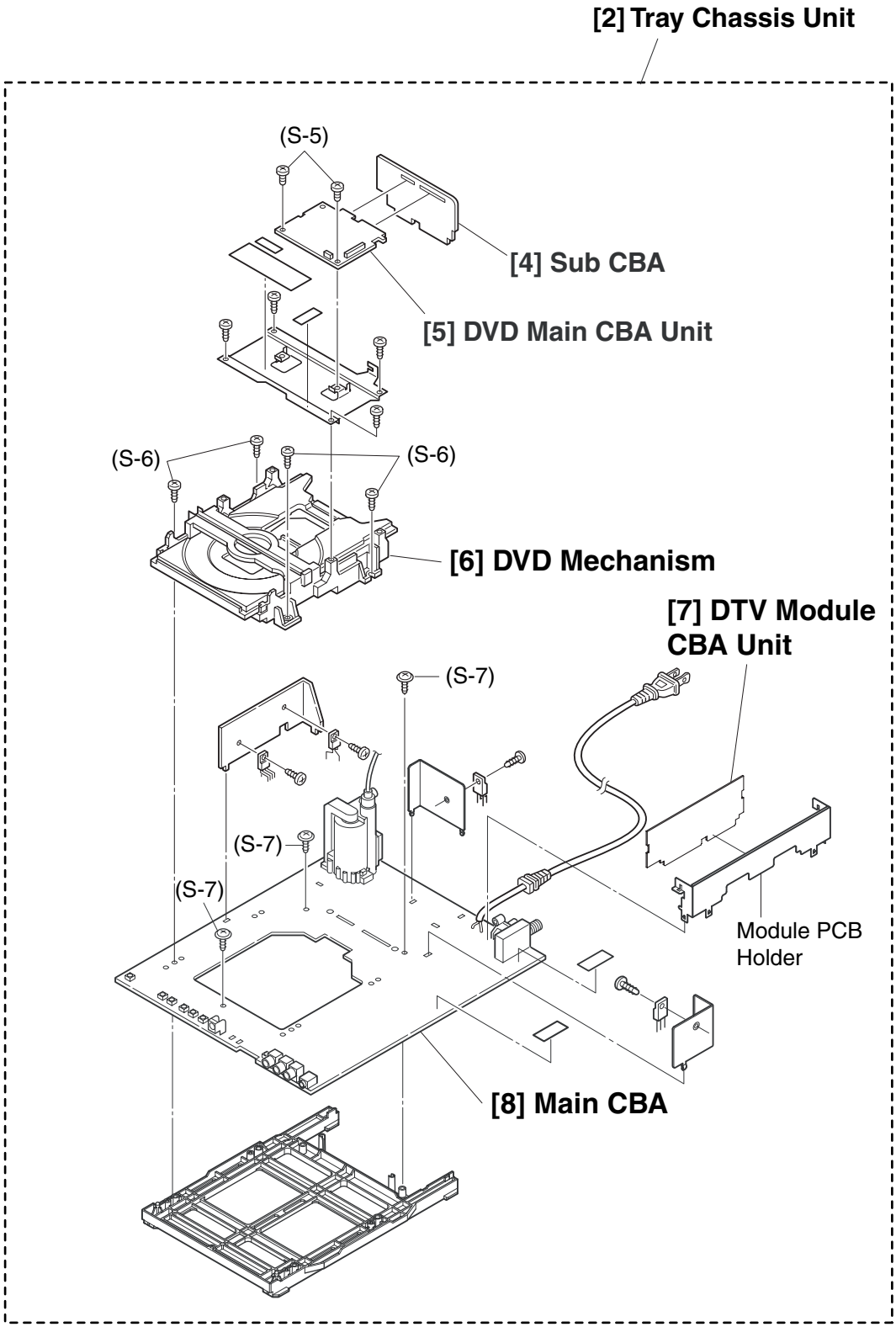
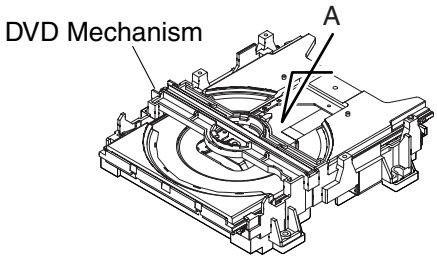
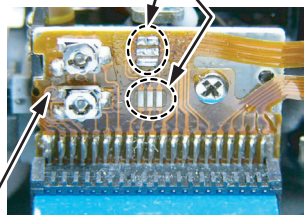

[2] Tray Chassis Unit
(S-5)
[4] Sub CBA
[5] DVD Main CBA Unit
(S-6)
(S-6)
[6] DVD Mechanism
[7] DTV Module
CBA Unit
(S-7)
(S-7)
(S-7)
Module PCB
Holder
[8] Main CBA

Fig. D3



Short the three short lands by soldering.
(Either of two places.)



FPC Cable

View for A

Fig. D4

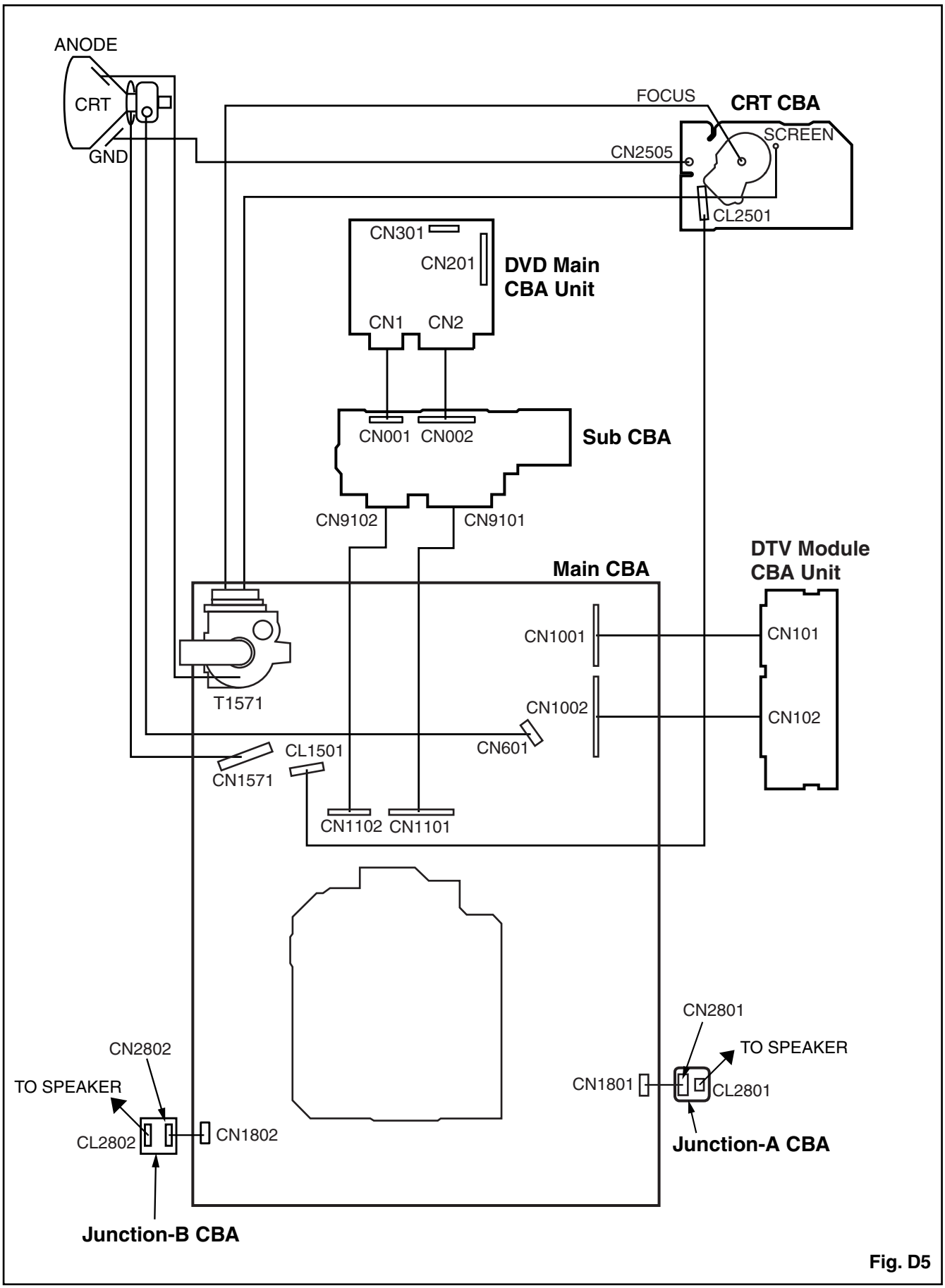

ANODE
CRT
GND
FOCUS
CRT CBA
SCREEN
CN2505
CL2501
CN301
CN201
DVD Main
CBA Unit
CN1
CN2
CN001
CN002
Sub CBA
CN9102
CN9101
DTV Module
CBA Unit
Main CBA
CN1001
CN101
CN1002
CN102
T1571
CN601
CL1501
CN1571
CN1102
CN1101
CN2801
TO SPEAKER
CN1801
CL2801
Junction-A CBA
CN2802
TO SPEAKER
CL2802
CN1802
Junction-B CBA

Fig. D5

ELECTRICAL ADJUSTMENT INSTRUCTIONS

General Note:

"CBA" is abbreviation for "Circuit Board Assembly."

NOTE:

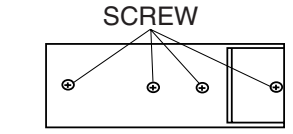
Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed.
Also, do not attempt these adjustments unless the proper equipment is available.

Test Equipment Required

1. NTSC Pattern Generator (Color Bar W/White Window, Red Color, Dot Pattern, Gray Scale, Monoscope, Multi-Burst)
2. AC Milli Voltmeter (RMS)
3. DC Voltmeter
4. Oscilloscope: Dual-trace with 10:1 probe,
   V-Range: 0.001~50V/Div,
   F-Range: DC~AC-60MHz
5. Frequency Counter
6. Plastic Tip Driver
7. Color Analyzer

How to make the service remote control unit:

1. Prepare the remote control unit (Part No. NE241UD). Remove 4 screws from the back lid. (Fig. 1)



Remote control unit (Bottom) **Fig. 1**

2. Cut off pin 10 of the remote control microprocessor and short circuit pins 10 and 17 of the microprocessor with a jumper wire.

How to enter the Service mode:

Service mode:

1. Use the service remote control unit.
2. Turn the power on.
3. To change TV/VIDEO mode or DTV mode, press [SELECT] button on the remote control unit.
4. Press [DISC MENU] button on the service remote control unit. Version of micro computer will be displayed on the CRT. (Ex: A14-0.34)

1. DC 114V (+B) Adjustment

Purpose: To obtain correct operation.

Symptom of Misadjustment: The picture is dark and the unit does not operate correctly.

Test point	Adj. Point	Mode	Input
J1558(+B) GND	VR1601	---	-----
Tape	**M. EQ.**	**Spec.**	
---	DC Voltmeter Plastic Tip Driver	+114±0.5V DC	

Note:
J1558 (+B), VR1601 --- Main CBA

1. Connect the unit to AC Power Outlet.
2. Connect DC Volt Meter to J1558 (+B) and GND.
3. Adjust VR1601 so that the voltage of J1558 (+B) becomes +114±0.5V DC.

2. Setting for BRIGHT, CONTRAST, COLOR, TINT, V-TINT and SHARP Data Values

<TV/VIDEO mode>

1. Enter the Service mode in TV/VIDEO mode.
2. Press [PICTURE] button on the service remote control unit. Display changes “BRT,” “CNT,” “CLR,” “TNT,” “V-TNT,” and “SHP” cyclically when [PICTURE] button is pressed.

BRIGHT (BRT)

1. Press [PICTURE] button on the service remote control unit. Then select "BRIGHT" (BRT) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "BRIGHT" (BRT) becomes 90.

CONTRAST (CNT)

1. Press [PICTURE] button on the service remote control unit. Then select "CONTRAST" (CNT) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "CONTRAST" (CNT) becomes 80.

COLOR (CLR)

1. Press [PICTURE] button on the service remote control unit. Then select "COLOR" (CLR) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "COLOR" (CLR) becomes 58.

TINT (TNT)

1. Press [PICTURE] button on the service remote control unit. Then select "TINT" (TNT) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "TINT" (TNT) becomes 56.

V-TINT (V-TNT)

1. Press [PICTURE] button on the service remote control unit. Then select "V-TINT" (V-TNT) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "V-TINT" (V-TNT) becomes 56.

SHARP (SHP)

1. Press [PICTURE] button on the service remote control unit. Then select "SHARP" (SHP) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "SHARP" (SHP) becomes 40.

<DTV mode>

1. Enter the Service mode in DTV mode.
2. Press [PICTURE] button on the service remote control unit. Display changes “C-CNT,” “C-CLR,” “C-TNT,” and “C-SHP” cyclically when [PICTURE] button is pressed.

CONTRAST (C-CNT)

1. Press [PICTURE] button on the service remote control unit. Then select "CONTRAST" (C-CNT) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "CONTRAST" (C-CNT) becomes 80.

COLOR (C-CLR)

1. Press [PICTURE] button on the service remote control unit. Then select "COLOR" (C-CLR) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "COLOR" (C-CLR) becomes 62.

TINT (C-TNT)

1. Press [PICTURE] button on the service remote control unit. Then select "TINT" (C-TNT) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "TINT" (C-TNT) becomes 56.

SHARP (C-SHP)

1. Press [PICTURE] button on the service remote control unit. Then select "SHARP" (C-SHP) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "SHARP" (C-SHP) becomes 40.

3. C-Trap Adjustment

Purpose: To get minimum leakage of the color signal carrier.

Symptom of Misadjustment: If C-Trap Adjustment is incorrect, stripes will appear on the screen.

Test point	Adj. Point	Mode	Input
TP1503 (BLUE)	[CH. ▲ / ▼] buttons	---	Color Bar
Tape	**M. EQ.**	**Spec.**	
---	Oscilloscope Pattern Generator	---	

Figure

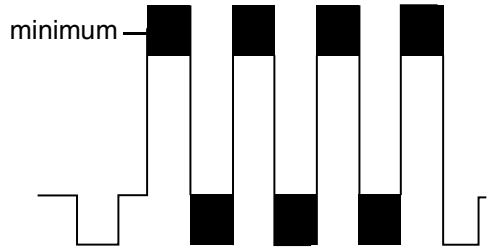


Fig. 2

Note: TP1503 (BLUE)--- Main CBA

1. Connect oscilloscope to TP1503.
2. Input a color bar signal from RF input.
3. Enter the Service mode in TV/VIDEO mode.
4. Press [0] button on the service remote control unit and select "C-TRAP" mode. (Display changes "C-TRP," "D-T TV," "D-T EXT," "D-T DVD," "B-S," and "B-S2" cyclically when [0] button is pressed.)
5. Press [CH. ▲ / ▼] buttons on the remote control unit so that the carrier leakage B-Out (3.58MHz) value becomes minimum on the oscilloscope.
6. Turn the power off and on again.

4. V. Size Adjustment

Purpose: To obtain correct vertical height of screen image.

Symptom of Misadjustment: If V. Size is incorrect, vertical height of image on the screen may not be properly displayed.

Test point	Adj. Point	Mode	Input
---	[CH. ▲ / ▼] buttons	---	Monoscope
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	90±5%	

1. Operate the unit for at least 20 minutes.
2. Enter the Service mode in TV/VIDEO mode.
3. Press [9] button on the service remote control unit and select V-S mode. (Display changes "V-S" and "V-P" cyclically when [9] button is pressed.)
4. Input monoscope pattern.
5. Press [CH. ▲ / ▼] buttons on the remote control unit so that the monoscope pattern is 90±5% of display size and the circle is round.

5. V. Position Adjustment

Purpose: To obtain correct vertical position of screen image.

Symptom of misadjustment: If V. Position is incorrect, vertical position of image on the screen may not be properly displayed.

Test point	Adj. Point	Mode	Input
---	[CH. ▲ / ▼] buttons	---	Monoscope
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	---	

1. Operate the unit for at least 20 minutes.
2. Enter the Service mode in TV/VIDEO mode.
3. Press [9] button on the service remote control unit and select "V-P" mode. (Display changes "V-S" and "V-P" cyclically when [9] button is pressed.)
4. Input monoscope pattern.
5. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the top and bottom of the monoscope pattern are equal each other.

6. H. Position Adjustment

Purpose: To obtain correct horizontal position of screen image.

Symptom of Misadjustment: If H. Position is incorrect, horizontal position of image on the screen may not be properly displayed.

Test point	Adj. Point	Mode	Input
---	[CH. ▲ / ▼] buttons	---	Mono-scope
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	---	

1. Operate the unit for at least 20 minutes.
2. Enter the Service mode in TV/VIDEO mode.
3. Press [8] button on the service remote control unit and select "H-P" mode.
4. Input monoscope pattern.
5. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the left and right side of the monoscope pattern are equal to each other.

7. White Balance Adjustment

Purpose: To mix red, green and blue beams correctly for pure white.

Symptom of Misadjustment: White becomes bluish or reddish.

Test Point	Adj. Point	Mode	Input
Screen	[CH. ▲ / ▼] buttons	RF	White Raster (APL 100%)
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator, Color Analyzer	See below	
Figure			

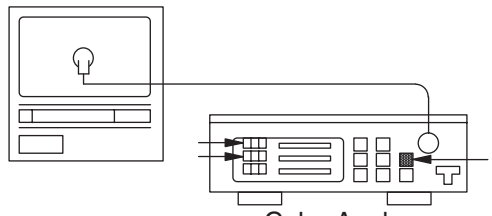


Fig. 3

Note: Use the service remote control unit

1. Operate the unit more than 20 minutes.
2. Face the unit to the east. Degauss the CRT using a degaussing coil.
3. Input the White Raster (APL 100%).
4. Set the color analyzer to the CHROMA mode and after zero point calibration, bring the optical receptor to the center on the tube surface (CRT).
5. Enter the Service mode in TV/VIDEO mode.
6. Press [VOL ▽] button on the service remote control to enter "C/D" mode. (Display changes "C/D," "YUV MEMORY," "TUNER," "QAM," "DTV-H," "D-SOUND," "DL V-CHIP," and "RC5" cyclically when [VOL ▽] button is pressed.)
7. Press [4] button on the service remote control unit for Red adjustment. Press [5] button on the service remote control unit for Blue adjustment.
8. In each color mode, press [CH. ▲ / ▼] buttons to adjust values of color.
9. Adjust Red and Blue color so that the temperature becomes 9200K (x: 286 / y: 294) ±3%.
10. At this time, check if horizontal line is white. If not, adjust Cut-off Adjustment until the horizontal line becomes pure white.
11. Turn off and on again to return to the normal mode. Receive APL 100% white signal and confirm that Chroma temperatures become 9200K (x: 286 / y: 294) ±3%.

Note: Confirm that Cut Off Adj. is correct after this adjustment, and attempt Cut Off Adj, if needed.

8. Sub-Brightness Adjustment

Purpose: To get proper brightness.

Symptom of Misadjustment: If Sub-Brightness is incorrect, proper brightness cannot be obtained by adjusting the Brightness Control.

Test Point	Adj. Point	Mode	Input
---	[CH. ▲ / ▼] buttons	RF	SMPTE 7.5IRE
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below	
Figure			

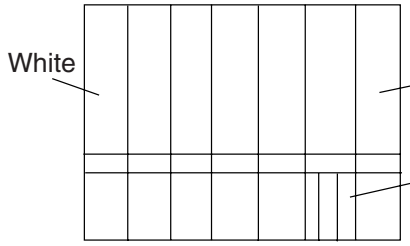


Fig. 4

Note: SMPTE Setup level --- 7.5 IRE

1. Enter the Service mode.
   Then input SMPTE signal from RF Input.
2. Press [PICTURE] button on the service remote control unit and select "BRT" mode. (Display changes "BRT," "CNT," "CLR," "TNT," "V-TNT," and "SHP" cyclically when [PICTURE] button is pressed.) Press [CH. ▲ / ▼] buttons so that the bar is just visible (See above figure).

9. Focus Adjustment

Purpose: Set the optimum Focus.

Symptom of Misadjustment: If Focus Adjustment is incorrect, blurred images are shown on the display.

Test Point	Adj. Point	Mode	Input
---	Focus VR	---	Mono-scope
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below	

Note: Focus VR (FBT) --- Main CBA,
FBT= Fly Back Transformer

1. Operate the unit more than 30 minutes
2. Face the unit to the East and degauss the CRT using a degaussing coil.
3. Input monoscope pattern.
4. Adjust the Focus VR on the FBT to obtain a clear picture.

10. H f_0 Adjustment

Purpose: To get correct horizontal frequency.

Symptom of Misadjustment: If H f_0 adjustment is incorrect, skew distortion will appear on the screen.

Test Point	Adj. Point	Mode	Input
R1583	[CH. ▲ / ▼] buttons	Video	---
Tape	**M. EQ.**	**Spec.**	
---	Frequency Counter	15.734kHz±300Hz	

Note: R1583 --- Main CBA

1. Connect frequency counter to R1583 and ground.
2. Set the unit to the VIDEO mode which is located before CH2 and no input is necessary.
3. Operate the unit for at least 20 minutes.
4. Enter the Service mode in TV/VIDEO mode.
5. Press [2] button on the service remote control unit and select H-ADJ mode.
6. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the display will change "0" ~ "7."
7. At this moment, choose display "0" ~ "7" when the frequency counter display is closest to 15.734 kHz±300Hz.

11. Cut-off Adjustment

Purpose: To adjust the beam current of R, G, B, and screen voltage.

Symptom of Misadjustment: White color may be reddish, greenish or bluish.

Test Point	Adj. Point	Mode	Input
---	Screen VR [CH. ▲ / ▼] buttons	RF	Black Raster
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See Reference Notes below.	

Figure

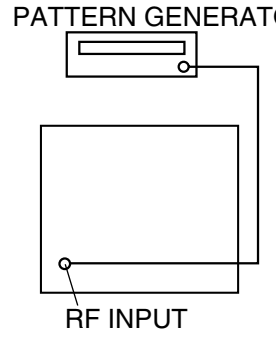


Fig. 5

Note: Screen VR FBT --- Main CBA
FBT= Fly Back Transformer
Use the service remote control unit

1. Degauss the CRT and allow the unit to operate for 20 minutes before starting the alignment.
2. Input the Black Raster Signal from RF Input.
3. Enter the Service mode in TV/VIDEO mode.
4. Press [VOL ▽] button on the service remote control to enter "C/D" mode. (Display changes "C/D," "YUV MEMORY," "TUNER," "QAM," "DTV-H," "D-SOUND," "DL V-CHIP," and "RC5" cyclically when [VOL ▽] button is pressed.)
5. Press [1] button on the service remote control unit and select "COR" mode.The display will momentarily show "COR". Now there should be a horizontal line across the center of the picture tube. If needed, gradually turn the screen control on the flyback clockwise until the horizontal line appears. Adjust the Red Cut off by pressing the "[CH. ▲ / ▼]" buttons. Proceed to Step 6 when the Red Cut off adjustment is done.
6. Press [2] button on the service remote control unit and select "COG" mode. The display will momentarily show "COG". Adjust the Green Cut off by pressing the "[CH. ▲ / ▼]" buttons. Proceed to step 7 when the Green Cut off adjustment is done.
7. Press [3] button on the service remote control unit and select "COB" mode. The display will momentarily show "COB". Adjust the Blue cut off by pressing the "[CH. ▲ / ▼]" buttons. When done with steps 5, 6 and 7 the horizontal line should be pure white. If not, then attempt the Cut off adjustment again.

The following 2 adjustments normally are not attempted in the field. They should be done only when replacing the CRT then adjust as a preparation.

12. Purity Adjustment

Purpose: To obtain pure color.

Symptom of Misadjustment: If Color Purity Adjustment is incorrect, large areas of color may not be properly displayed.

Test point	Adj. Point	Mode	Input
---	Deflection Yoke Purity Magnet	---	*Red Color
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below.	

Figure

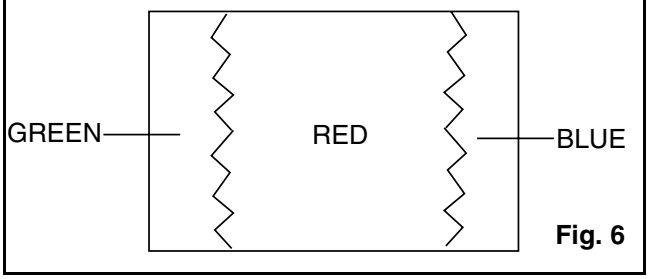


Fig. 6

* This becomes RED COLOR if the [7] button is pressed while in service mode.

1. Set the unit facing east.
2. Operate the unit for over 30 minutes before adjusting.
3. Fully degauss the unit using an external degaussing coil.
4. Set the unit to the AUX mode which is located before CH2, then input a red raster from video in.
5. Loosen the screw on the Deflection Yoke Clamper and pull the Deflection Yoke back away from the screen. (See Fig. 7.)
6. Loosen the Ring Lock and adjust the Purity Magnets so that a red field is obtained at the center of the screen. Tighten Ring Lock. (See Fig. 6,7.)
7. Slowly push the Deflection Yoke toward the bell of the CRT and set it where a uniform red field is obtained.
8. Tighten the clamp screw on the Deflection Yoke.

13. Convergence Adjustment

Purpose: To obtain proper convergence of red, green and blue beams.

Symptom of Misadjustment: If Convergence Adjustment is incorrect, the edge of white letters may have color edges.

Test point	Adj. Point	Mode	Input
---	C.P. Magnet (RB), C.P. Magnet (RB-G), Deflection Yoke	---	Dot Pattern or Crosshatch
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below.	

Figure

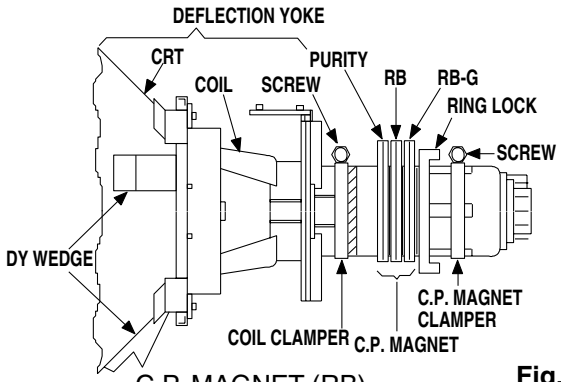


Fig. 7

C.P. MAGNET (RB)

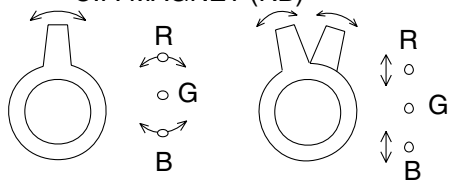


Fig. 8

C.P. MAGNET (RB-G)

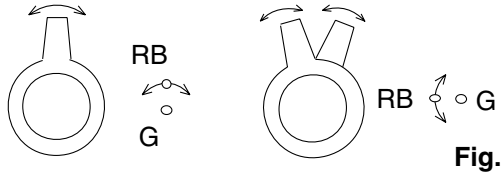


Fig. 9

1. Set the unit to the AUX mode which is located before CH2, then input a dot or crosshatch pattern.
2. Loosen the Ring Lock and align red with blue dots or crosshatch at the center of the screen by rotating (RB) C.P. Magnets. (See Fig. 8.)
3. Align red / blue with green dots at the center of the screen by rotating (RB-G) C.P. Magnet. (See Fig. 9.)
4. Fix the C.P. Magnets by tightening the Ring Lock.
5. Remove the DY Wedges and slightly tilt the Deflection Yoke horizontally and vertically to obtain the best overall convergence.
6. Fix the Deflection Yoke by carefully inserting the DY Wedges between CRT and Deflection Yoke.

HOW TO INITIALIZE THE TV/DVD

To put the program back at the factory-default, initialize the TV/DVD as the following procedure.

< DVD Section >

1. Press [1], [2], [3], [4], and [DISPLAY] buttons on the remote control unit in that order.
   Fig. g appears on the screen.

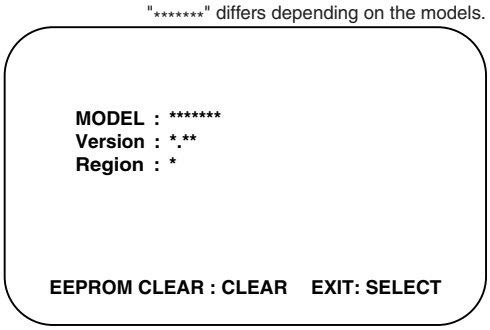


Fig. g

2. Press [CLEAR] button on the remote control unit.
   Fig. h appears on the screen.

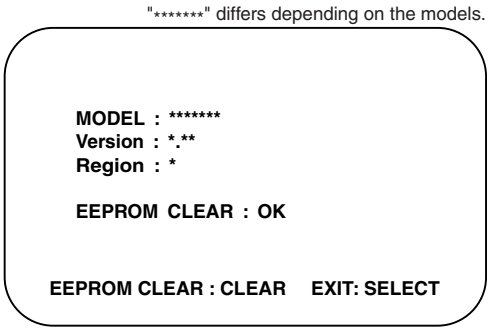


Fig. h

   When “OK” appears on the screen, the factory default will be set.
3. To exit this mode, press [CH. ▲ / ▼] or [SELECT] button to go to TV mode, or press [POWER] button to turn the power off.

< TV Section >

1. Use the service remote control unit.
2. Turn the power on. (Use main power on the TV unit.)
3. Press [DISC MENU] button on the service remote control unit to enter the Service mode. (Refer to “How to enter the Service mode” on page 6-1.)
4. Confirm that OSD indication on the four corners on TV screen changes from on and off light indication to red by pressing a [DISPLAY] button. (It is necessary for one or two seconds.)
5. Turn the power off by pressing main power button on the TV unit, and unplug the AC cord from the AC outlet.

FIRMWARE RENEWAL MODE

1. Turn the power on and press [SELECT] button on the remote control unit to put the TV/DVD into DVD mode. Then remove the disc on the tray.
   (It is possible to move to F/W version up mode only when the TV/DVD is in DVD mode with the tray open.)
2. To put the TV/DVD into F/W version up mode, press [9], [8], [7], [6], and [MODE] buttons on the remote control unit in that order.
   Fig. a appears on the screen.

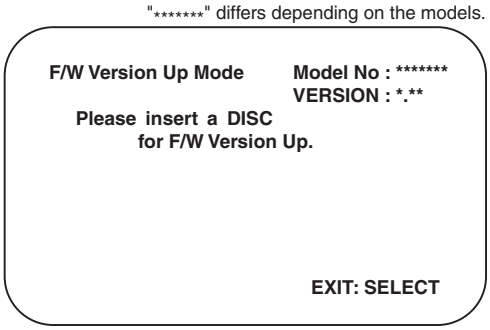


Fig. a Version Up Mode Screen

   The TV/DVD can also enter the version up mode with the tray open. In this case, Fig. a will be shown on the screen while the tray is open.
3. Load the disc for version up.
4. The TV/DVD enters the F/W version up mode automatically. Fig. c appears on the screen. If you enter the F/W for different models, “Disc Error” will appear on the screen, then the tray will open automatically.

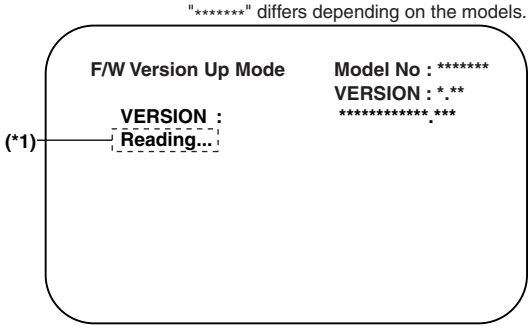


Fig. c Programming Mode Screen

The appearance shown in (*1) of Fig. c is described as follows:

No.	Appearance	State
1	Reading...	Sending files into the memory
2	Erasing...	Erasing previous version data
3	Programming...	Writing new version data

5. After programming is finished, the tray opens automatically. Fig. e appears on the screen and the checksum will be shown in (*2).

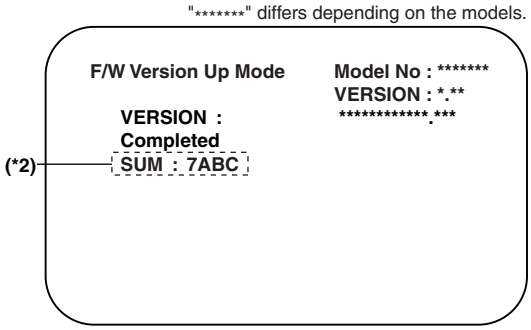


Fig. e Completed Program Mode Screen

   At this time, no button is available.
6. Remove the disc on the tray.
7. Press [CH. ▲ / ▼] button on the unit to go to TV mode, or press [POWER] button on the unit to turn the power off.
8. Press [SELECT] button on the remote control unit to put the TV/DVD into DVD mode again.
9. Press [1], [2], [3], [4], and [DISPLAY] buttons on the remote control unit in that order.
   Fig. g appears on the screen.

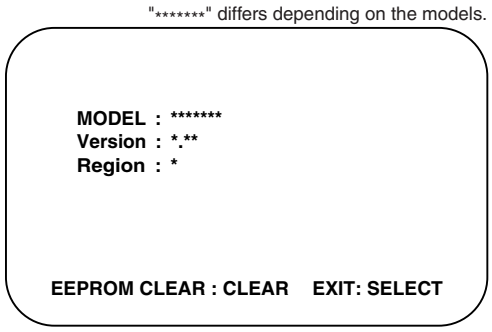


Fig. g

10. Press [CLEAR] button on the remote control unit.
    Fig. h appears on the screen.

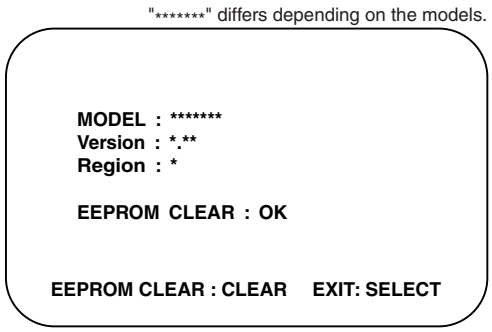
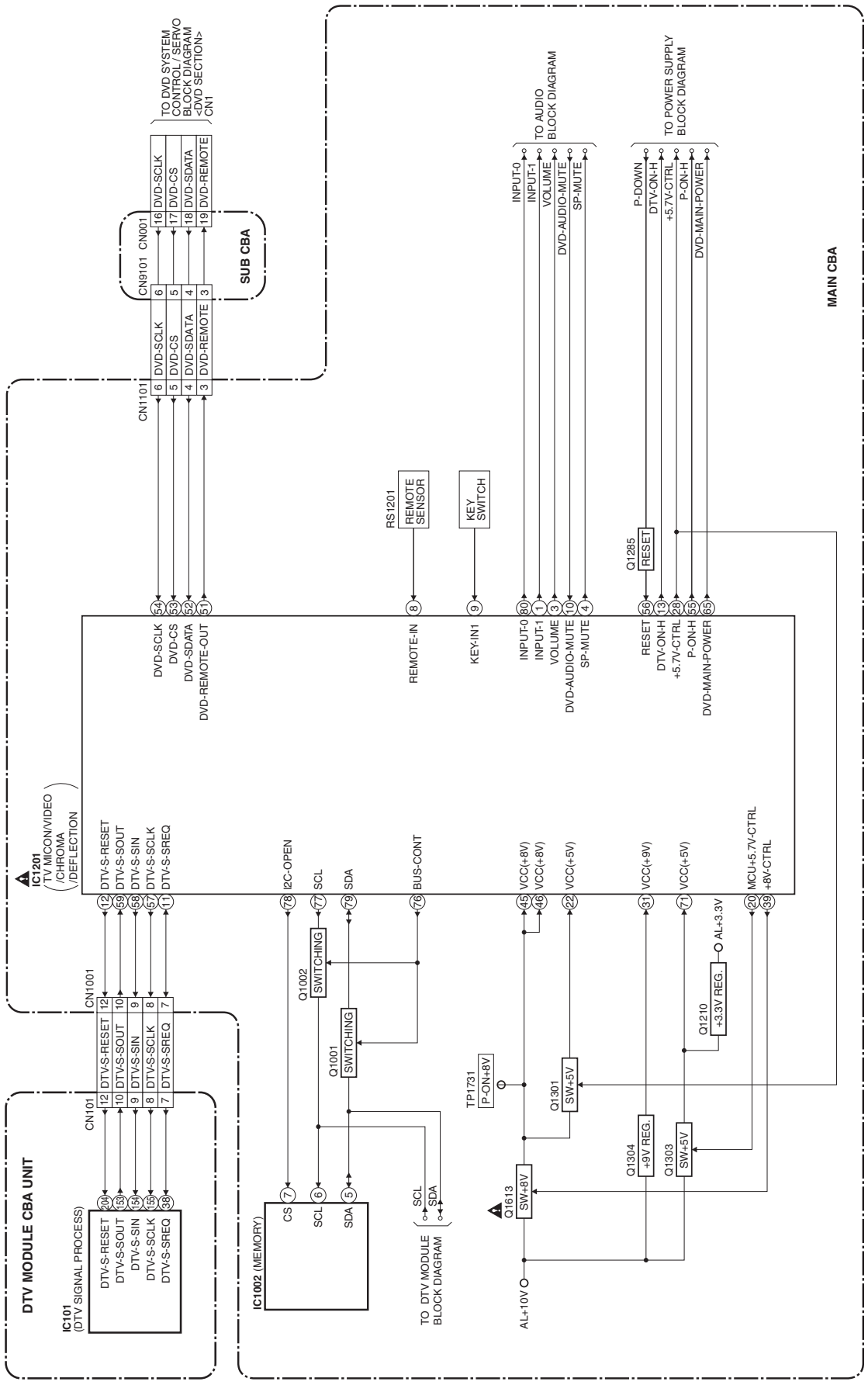


Fig. h

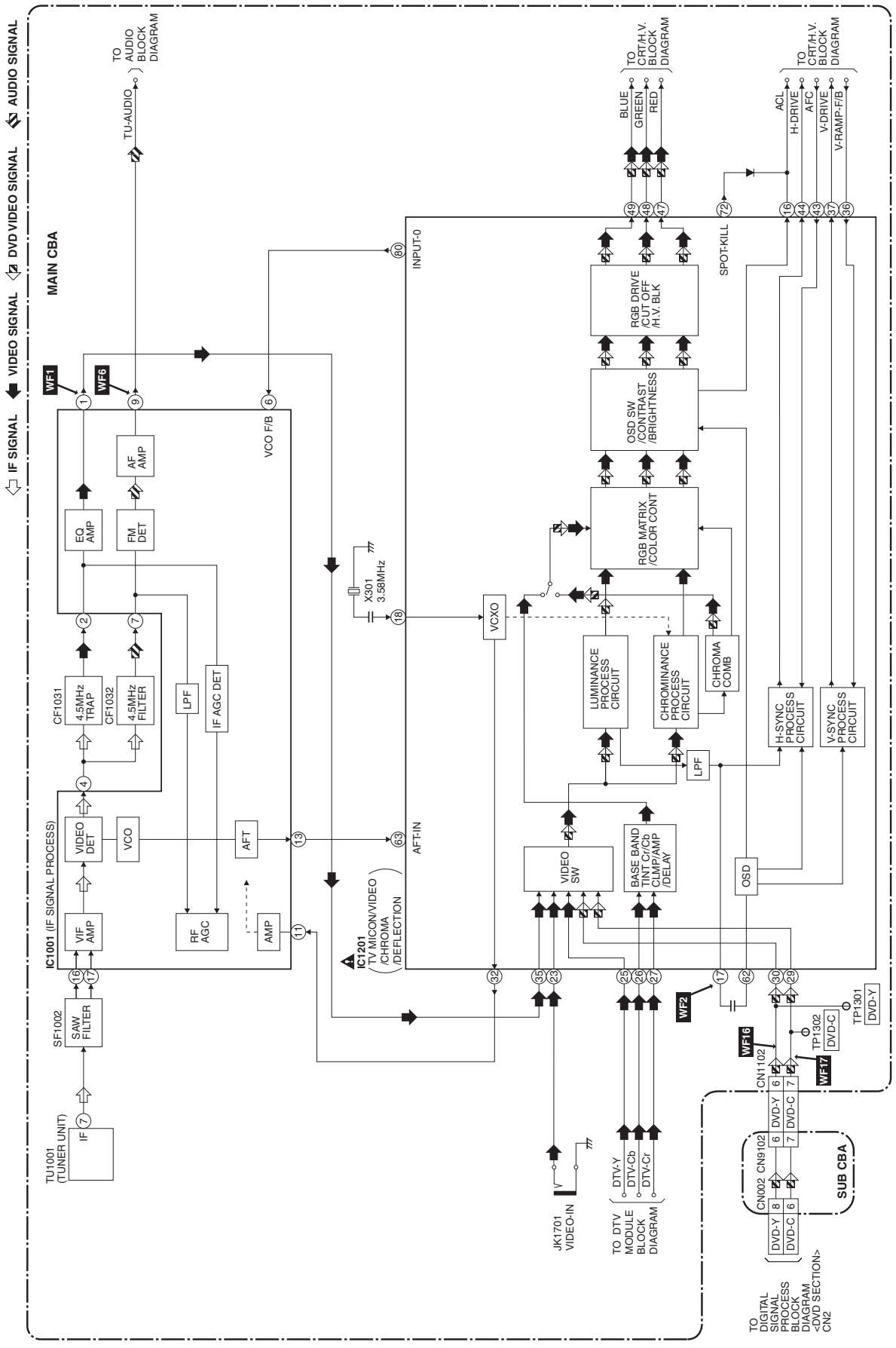
    When “OK” appears on the screen, the factory default will be set. Then the firmware renewal mode is complete.
11. To exit this mode, press [CH. ▲ / ▼] or [SELECT] button to go to TV mode, or press [POWER] button to turn the power off.

BLOCK DIAGRAMS < TV Section >

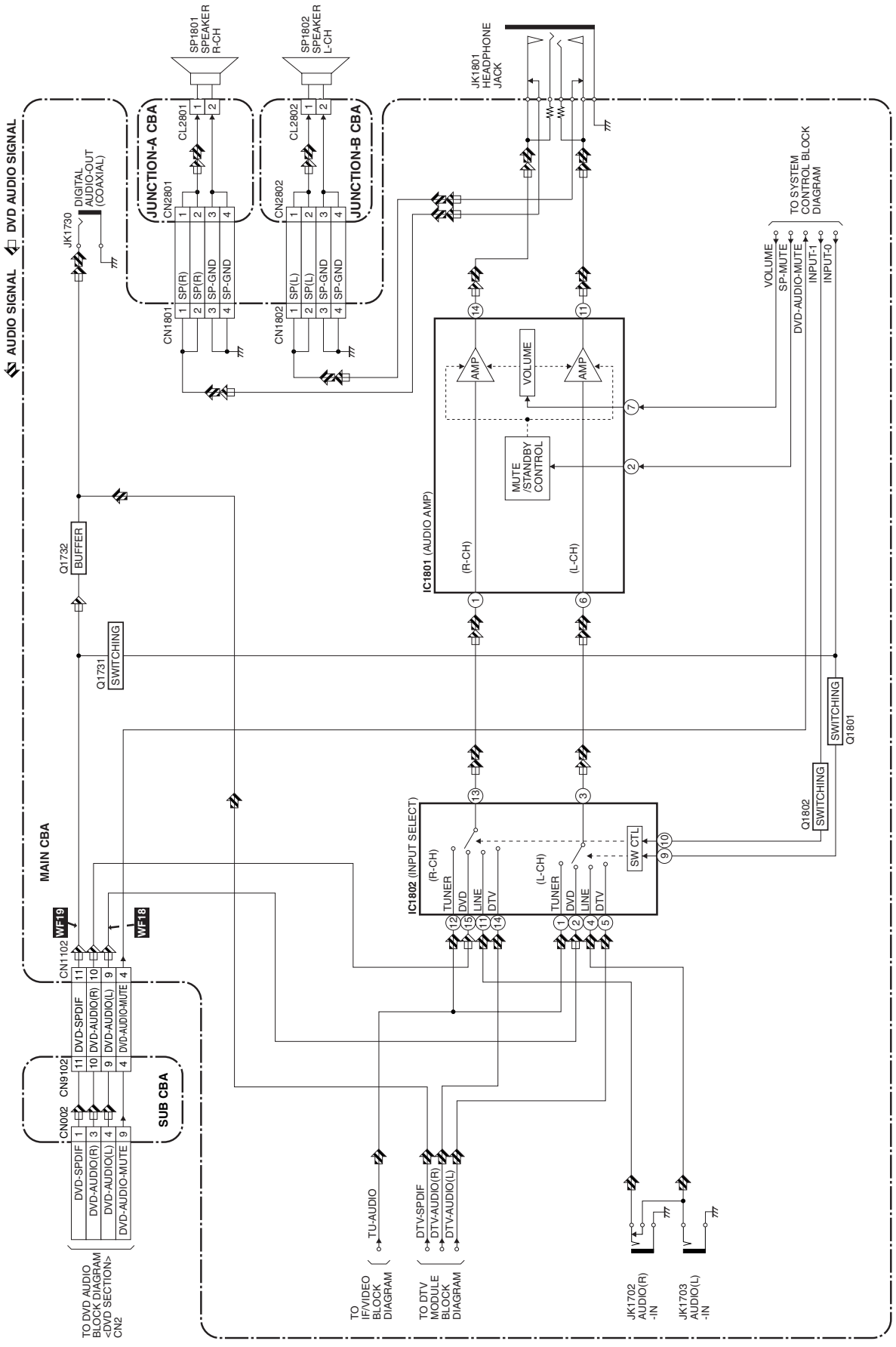
System Control Block Diagram



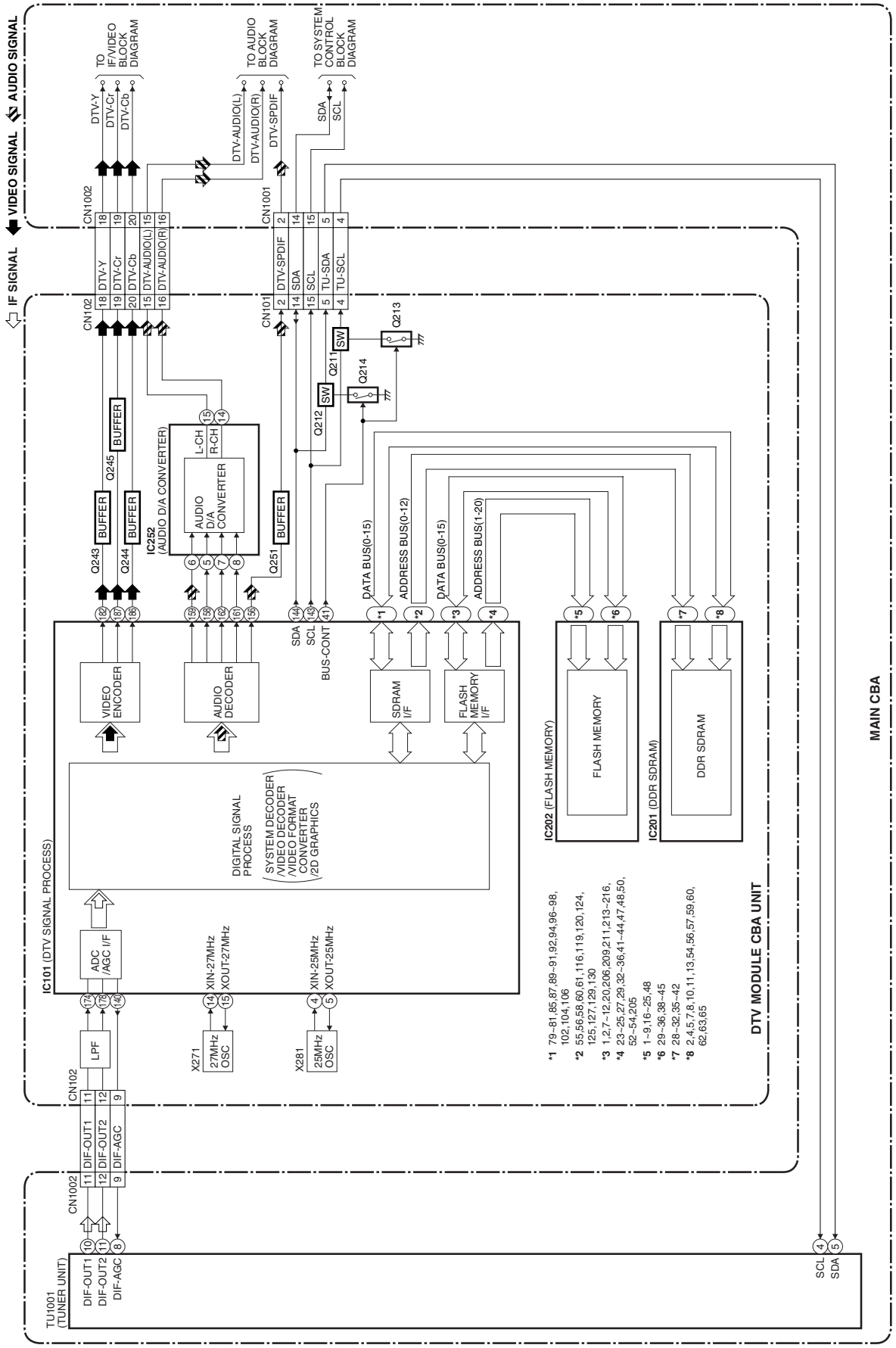
IF/Video Block Diagram



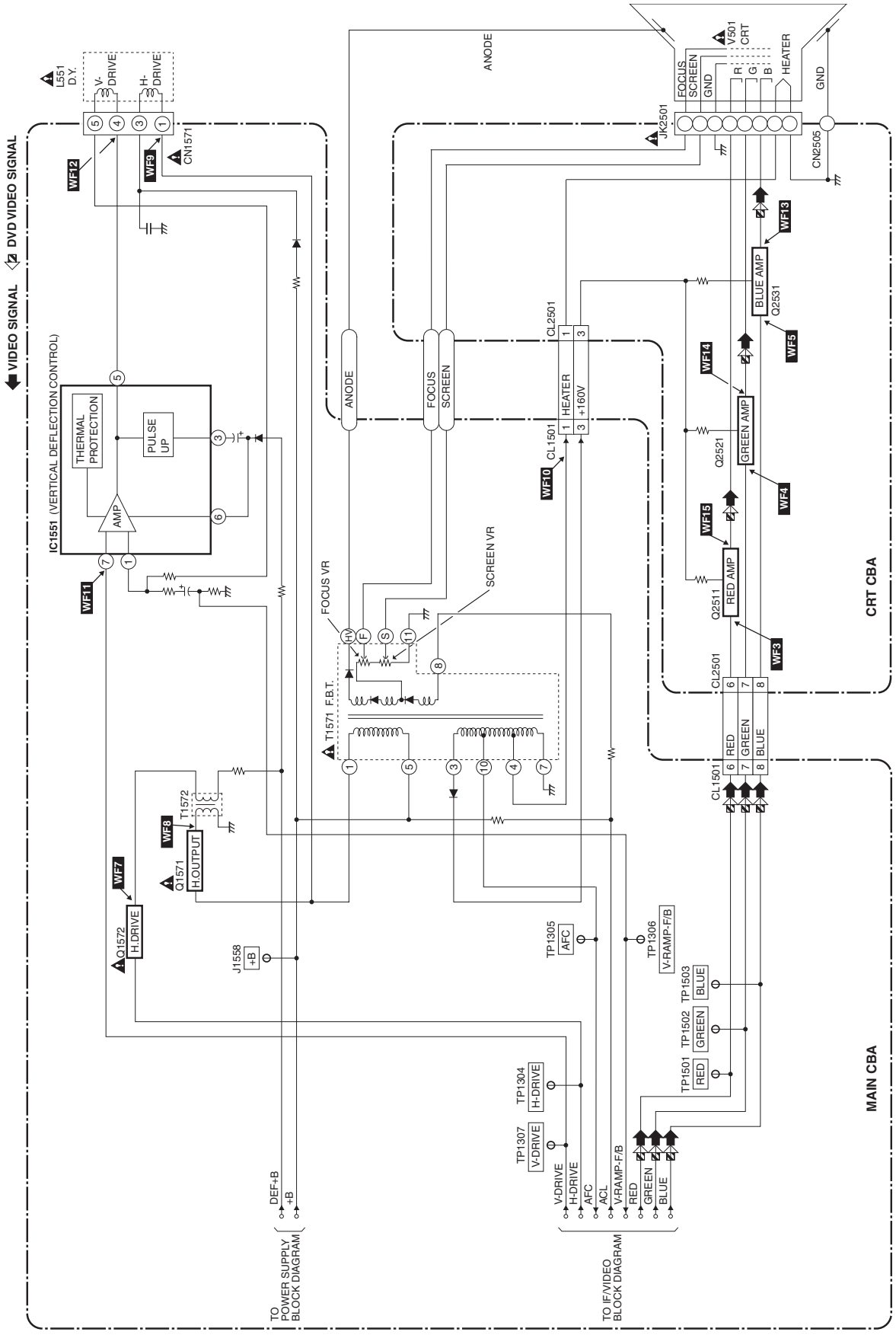
Audio Block Diagram



DTV Module Block Diagram



CRT/H.V. Block Diagram

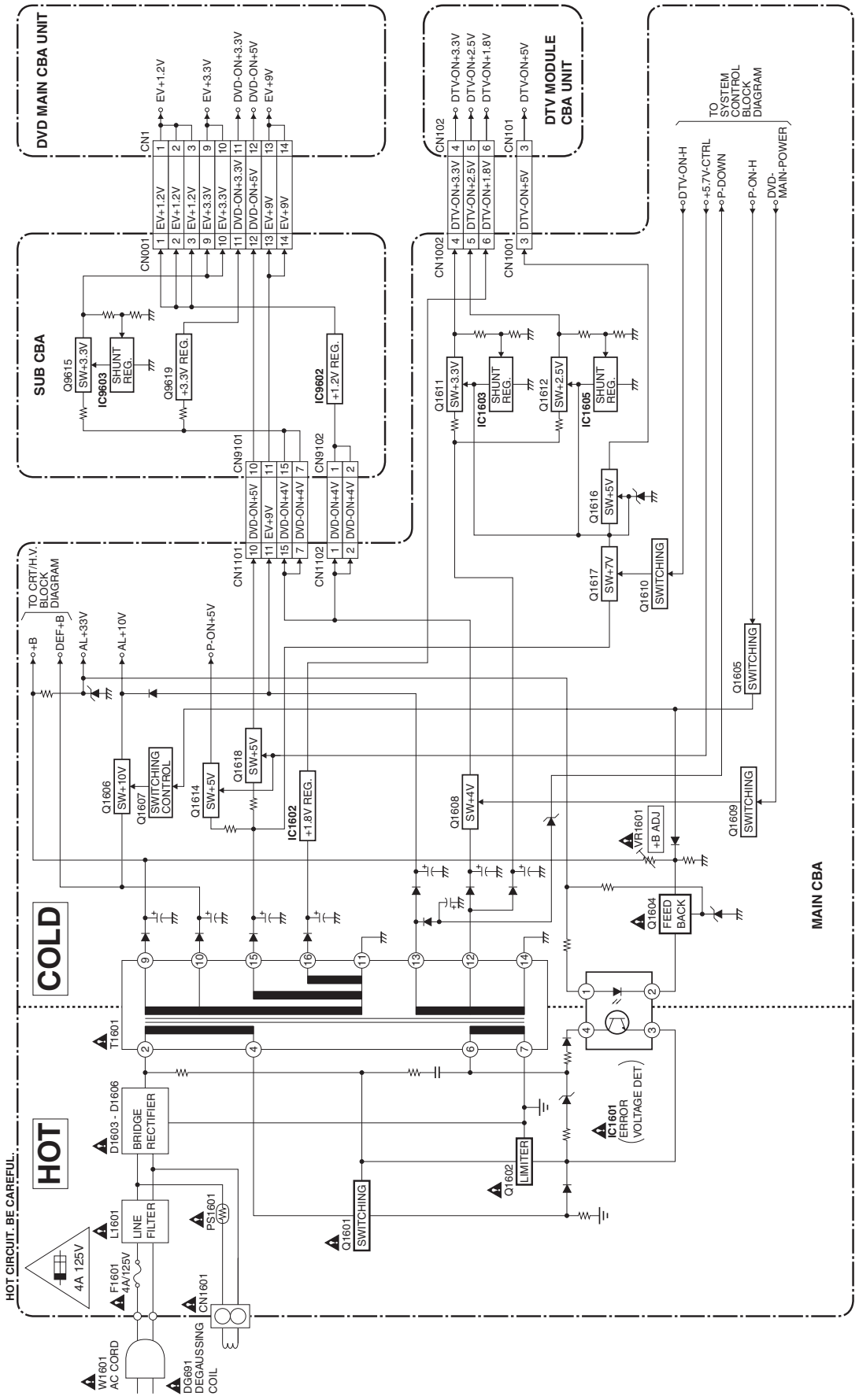


Power Supply Block Diagram

NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

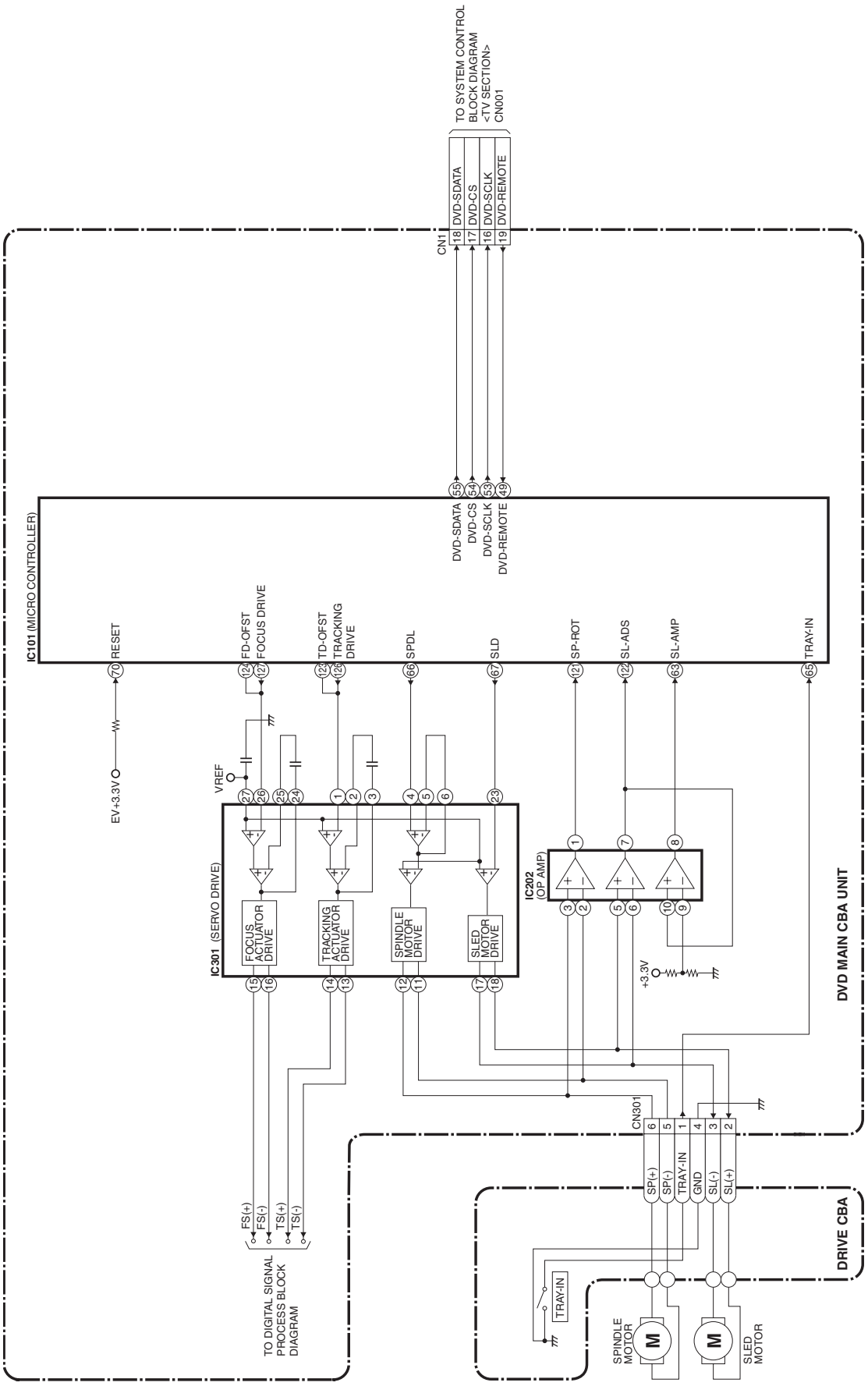
CAUTION ! : For continued protection against risk of fire, replace only with same type 4 A, 125V fuse.
ATTENTION : Utiliser un fusible de rechange de même type de 4A, 125V.

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F1601) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

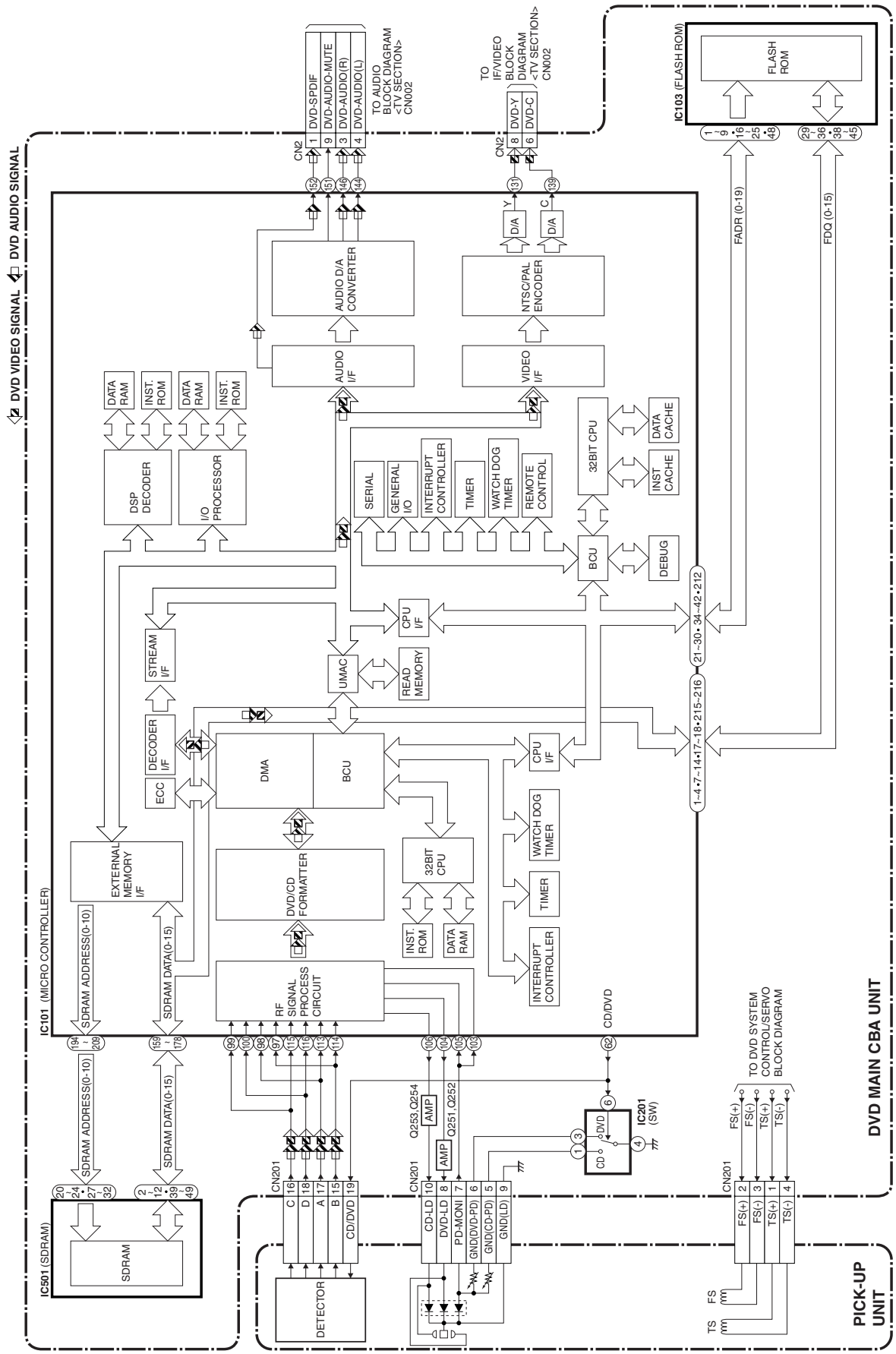


BLOCK DIAGRAMS < DVD Section >

DVD System Control / Servo Block Diagram



Digital Signal Process Block Diagram



SCHEMATIC DIAGRAMS / CBA'S AND TEST POINTS

Standard Notes

WARNING

Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the mark "⚠" in the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

Notes:

1. Do not use the part number shown on these drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since these drawings were prepared.
2. All resistance values are indicated in ohms ($K = 10^3$, $M = 10^6$).
3. Resistor wattages are 1/4W or 1/6W unless otherwise specified.
4. All capacitance values are indicated in μF ($P = 10^{-6}$ μF).
5. All voltages are DC voltages unless otherwise specified.

LIST OF CAUTION, NOTES, AND SYMBOLS USED IN THE SCHEMATIC DIAGRAMS ON THE FOLLOWING PAGES:

1. CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE4A, 125V FUSE.
ATTENTION: UTILISER UN FUSIBLE DE RECHANGE DE MÊME TYPE DE4A, 125V.

2. CAUTION:

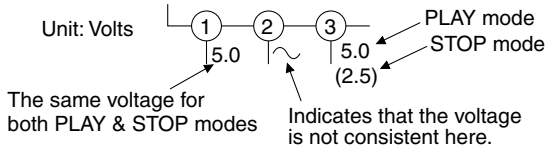
Fixed Voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F1601) is blown, first check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

3. Note:

1. Do not use the part number shown on the drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since the drawings were prepared.
2. To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

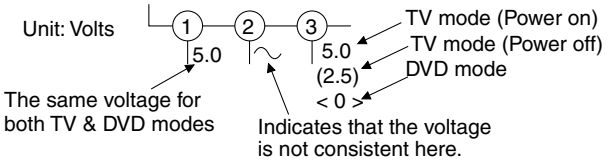
4. Voltage indications on the schematics are as shown below:

< DVD Section >

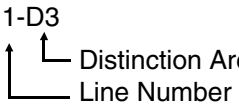


< TV Section >

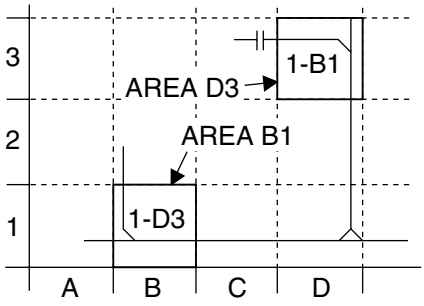
Unit: Volts



5. How to read converged lines



Examples:
1. "1-D3" means that line number "1" goes to the line number "1" of the area "D3".
2. "1-B1" means that line number "1" goes to the line number "1" of the area "B1".



6. Test Point Information

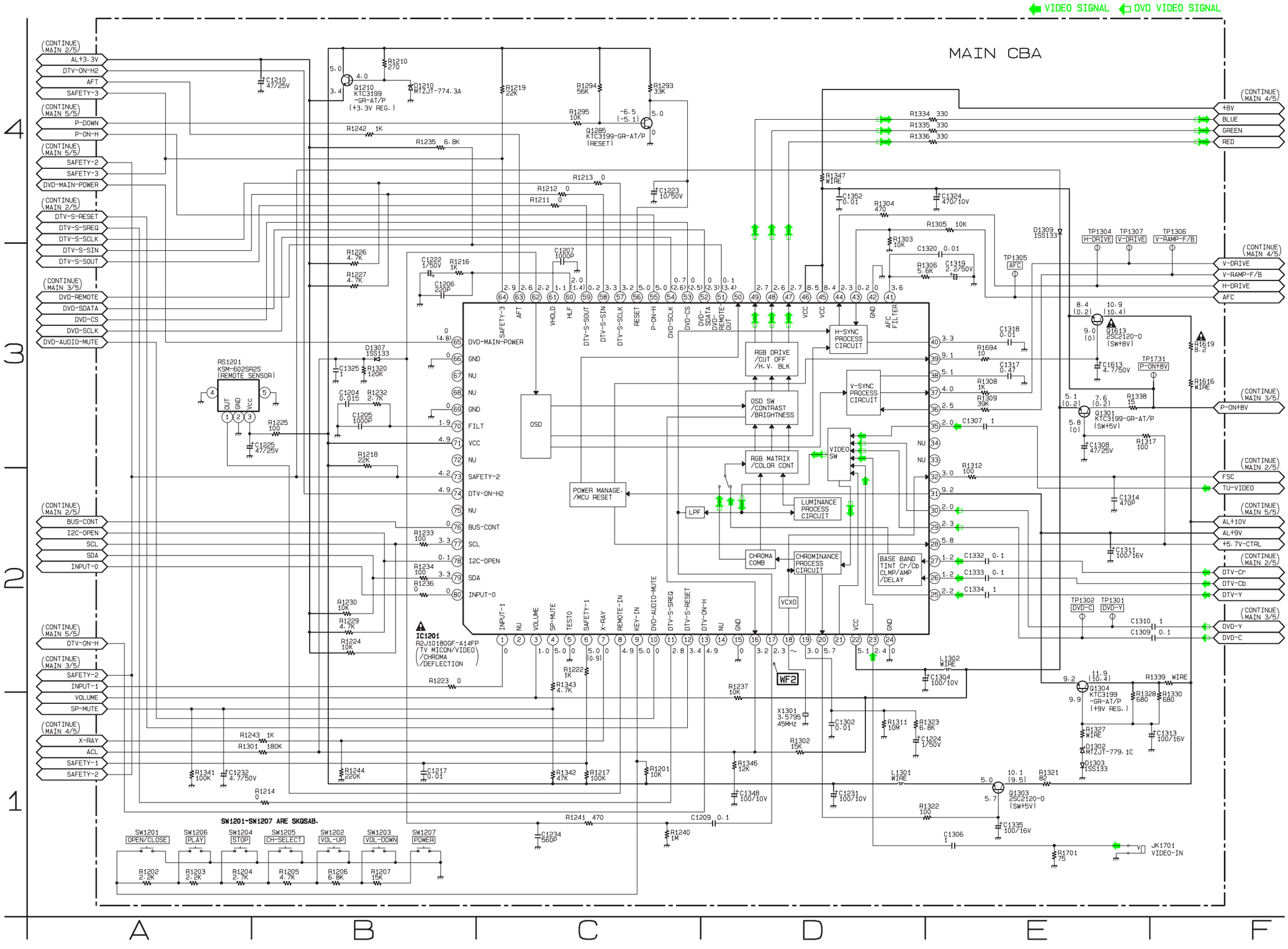
: Indicates a test point with a jumper wire across a hole in the PCB.

: Used to indicate a test point with a component lead on foil side.

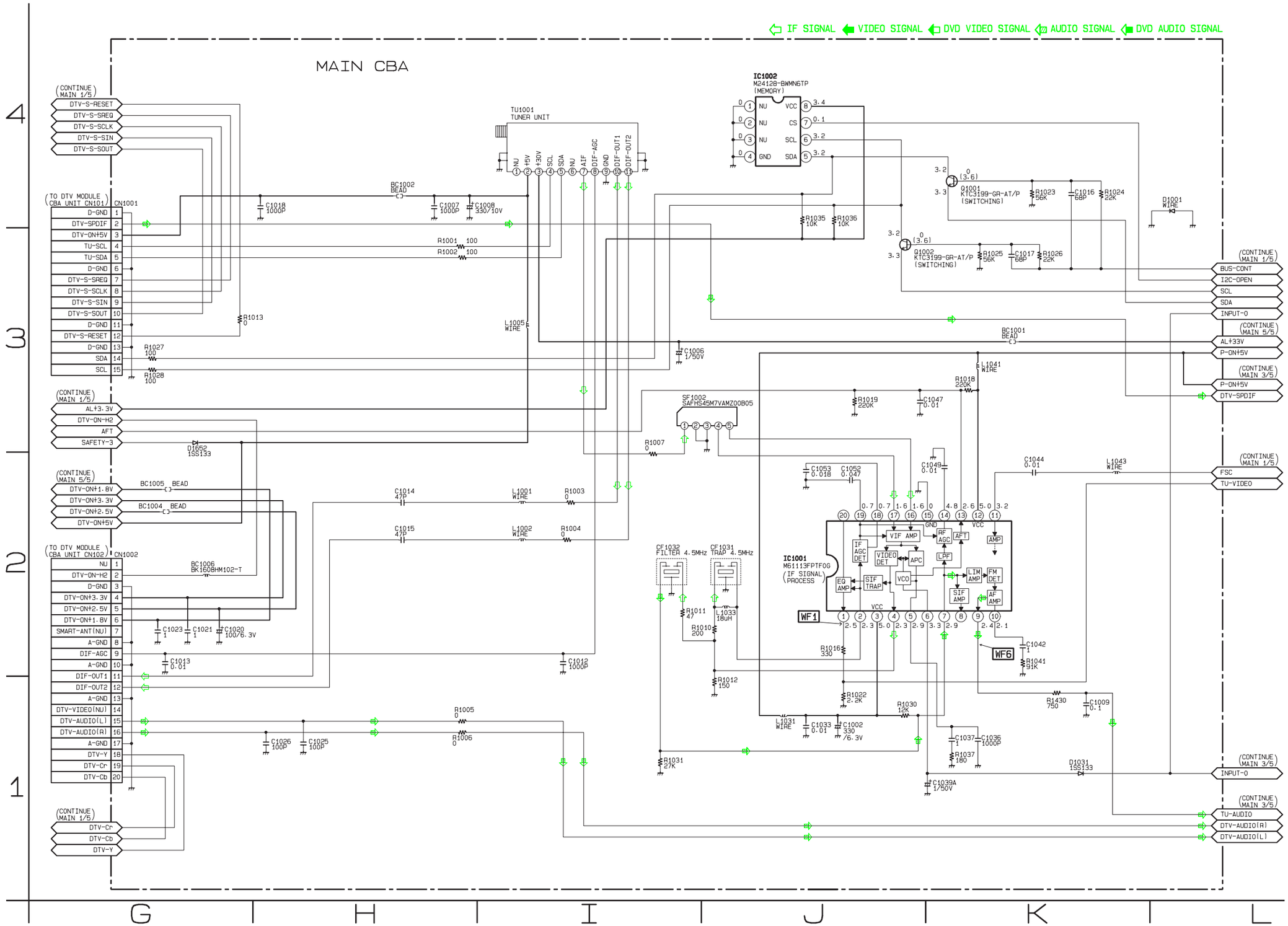
: Used to indicate a test point with no test pin.

: Used to indicate a test point with a test pin.

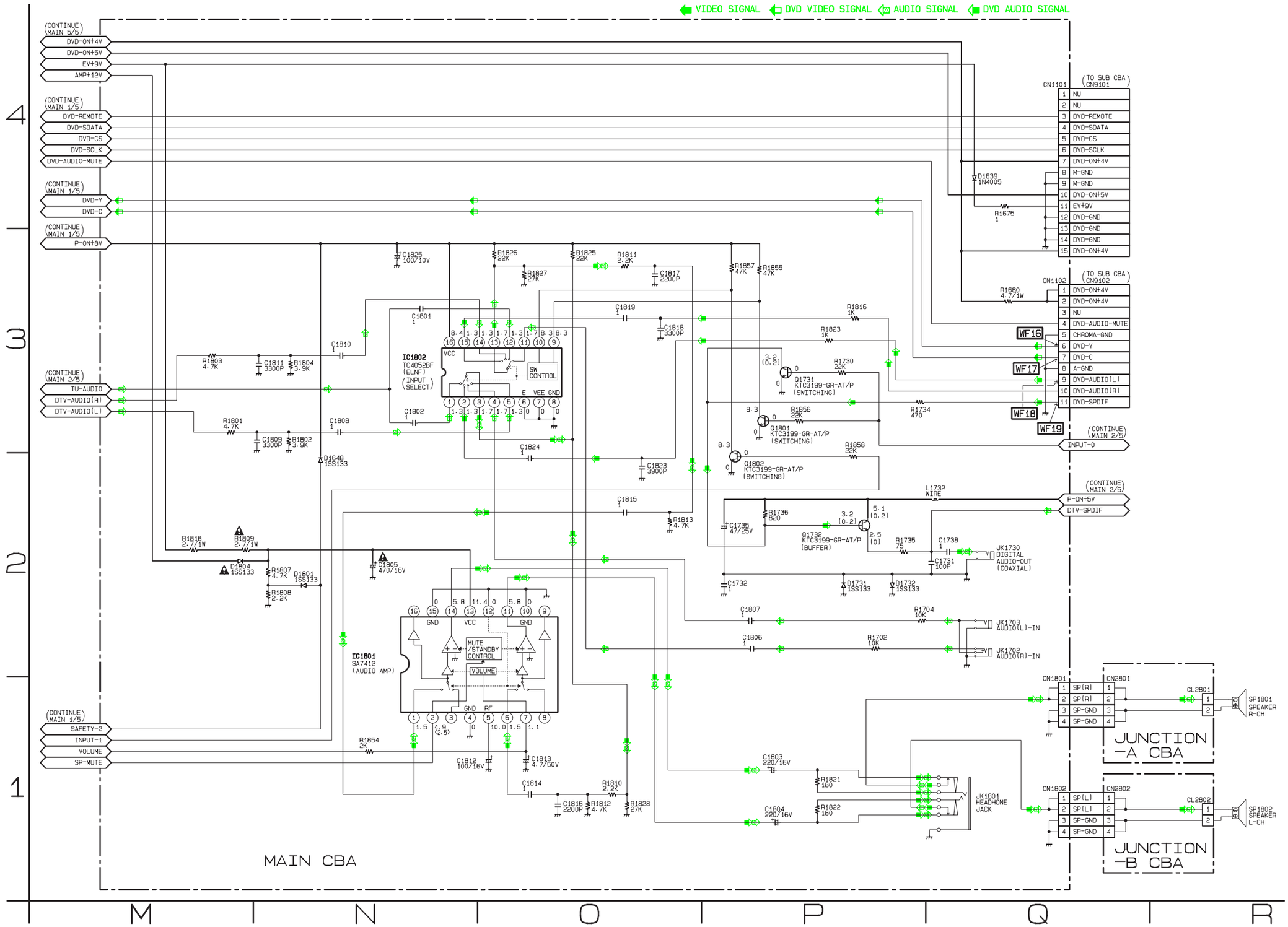
Main 1/5 Schematic Diagram < TV Section >



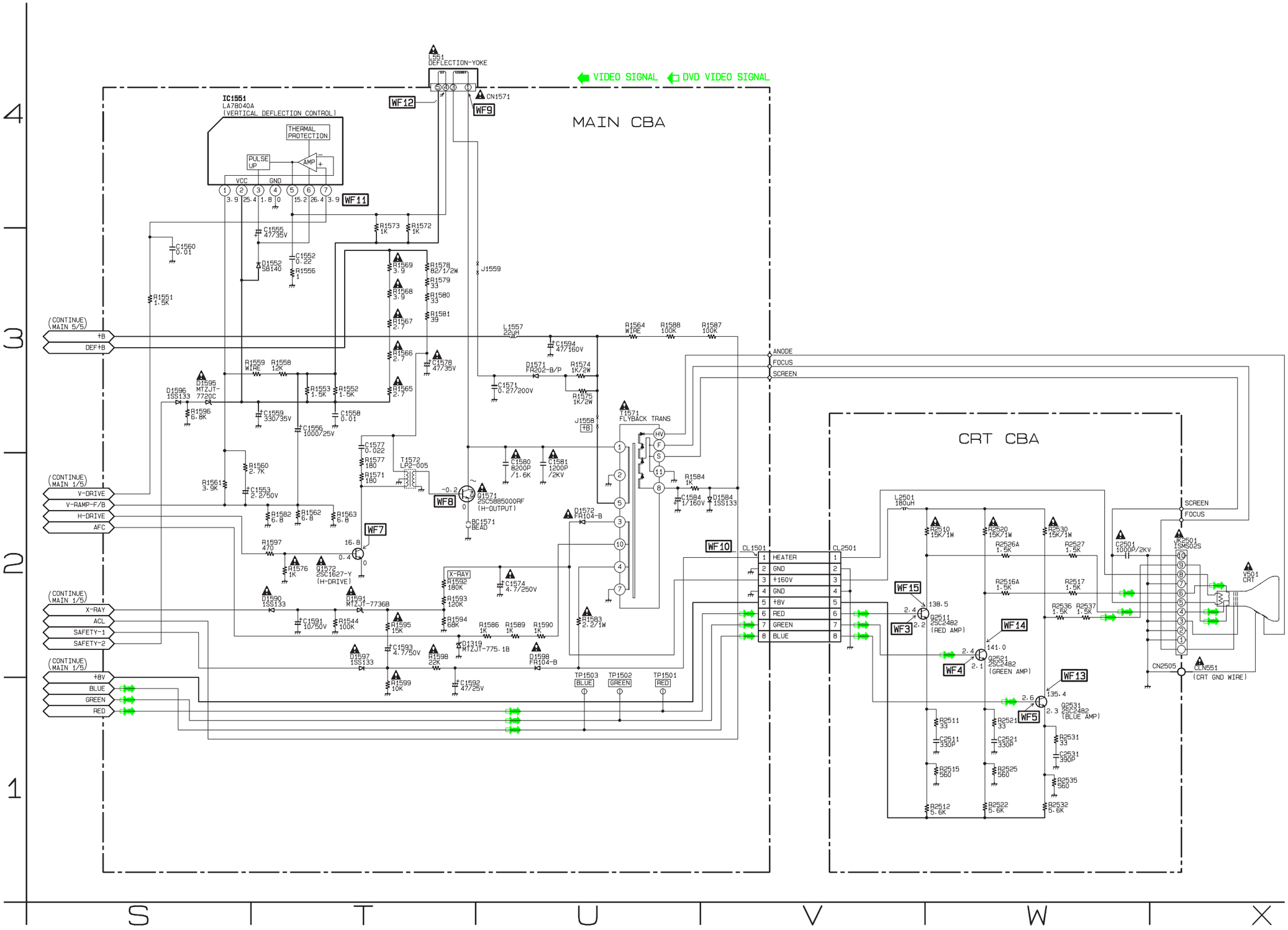
Main 2/5 Schematic Diagram < TV Section >



Main 3/5, Junction-A & Junction-B Schematic Diagram < TV Section >



Main 4/5 & CRT Schematic Diagram < TV Section >



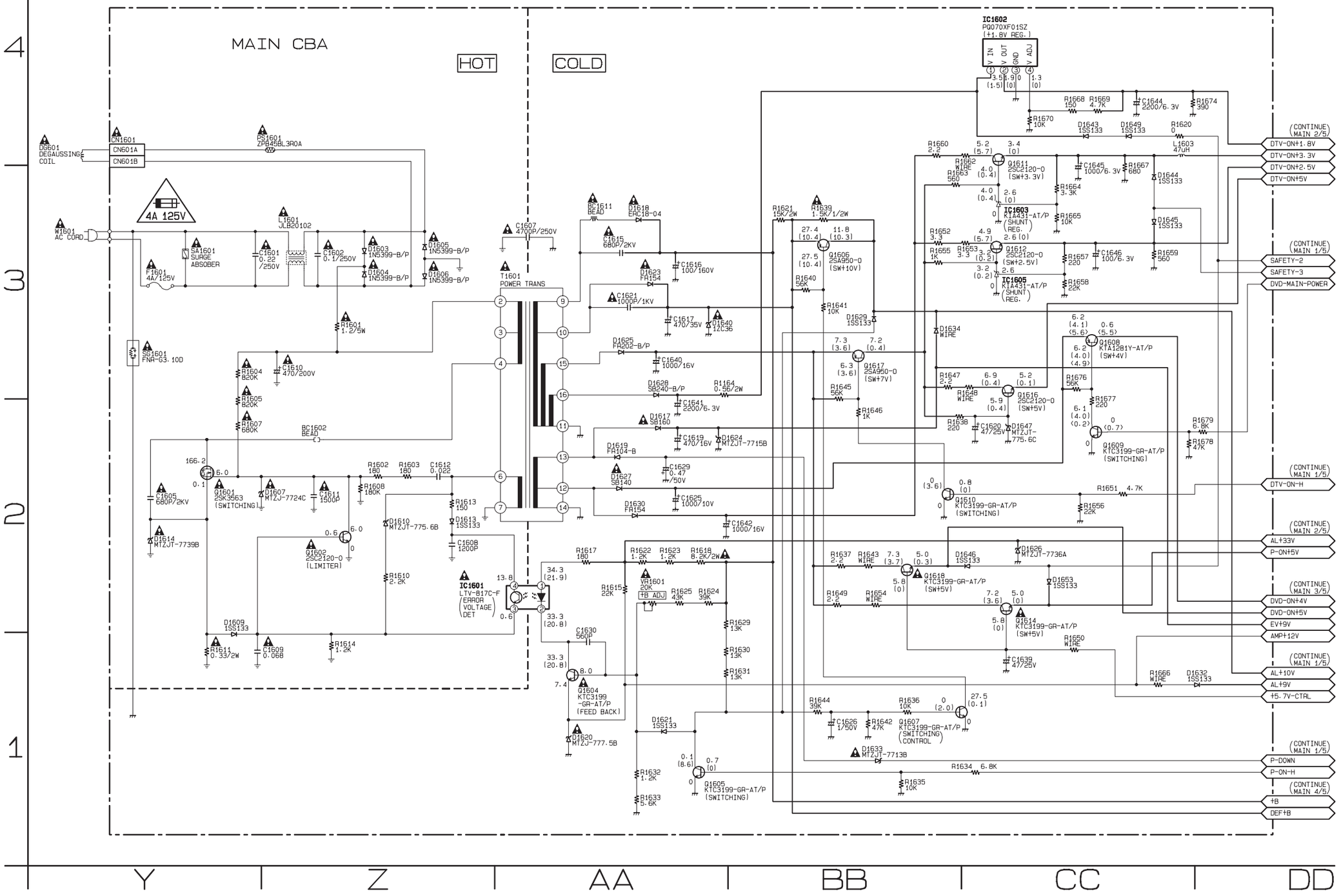
Main 5/5 Schematic Diagram < TV Section >

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F1601) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

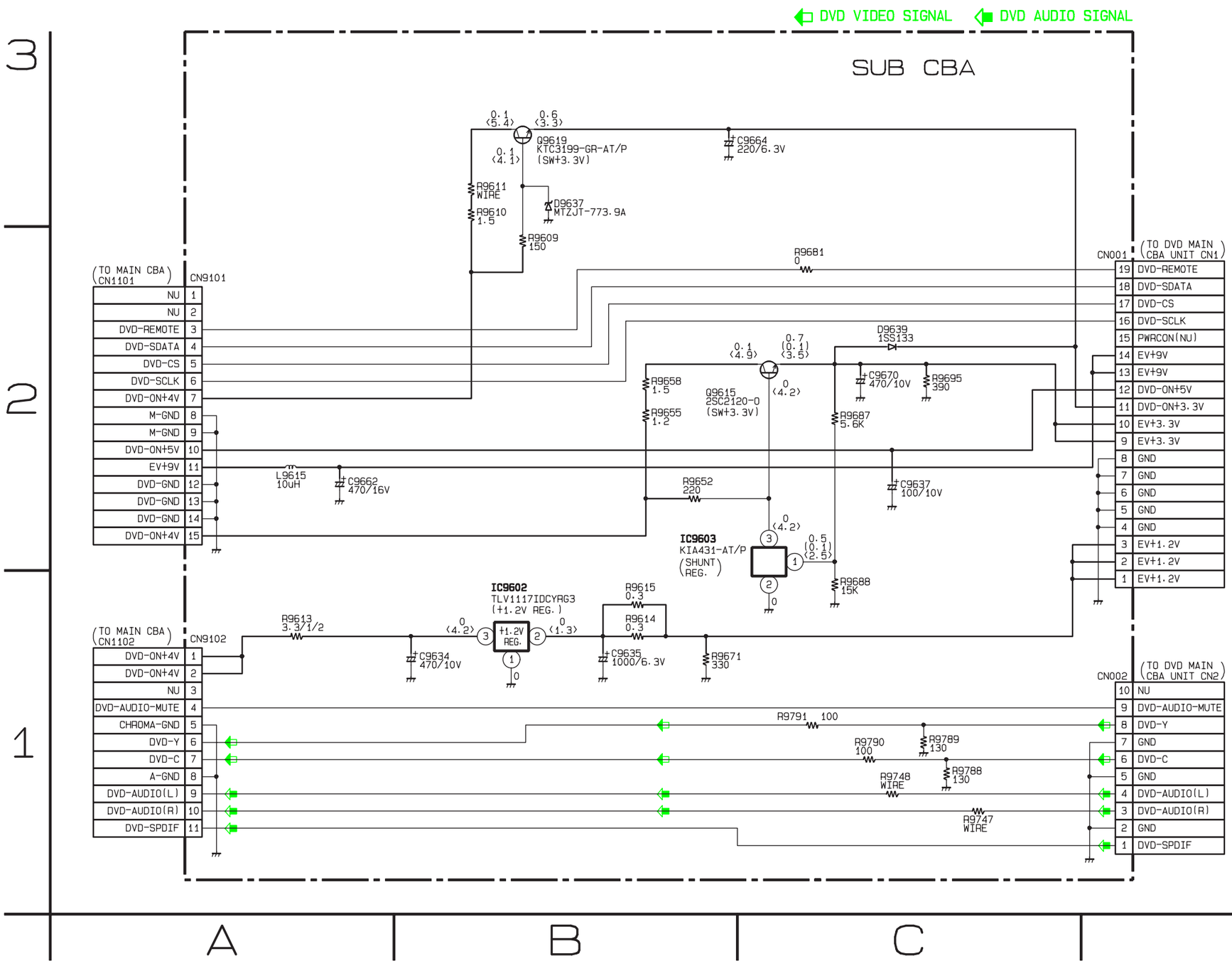
4A 125V

CAUTION ! : For continued protection against risk of fire, replace only with same type 4 A, 125V fuse.
ATTENTION : Utiliser un fusible de rechange de même type de 4A, 125V.

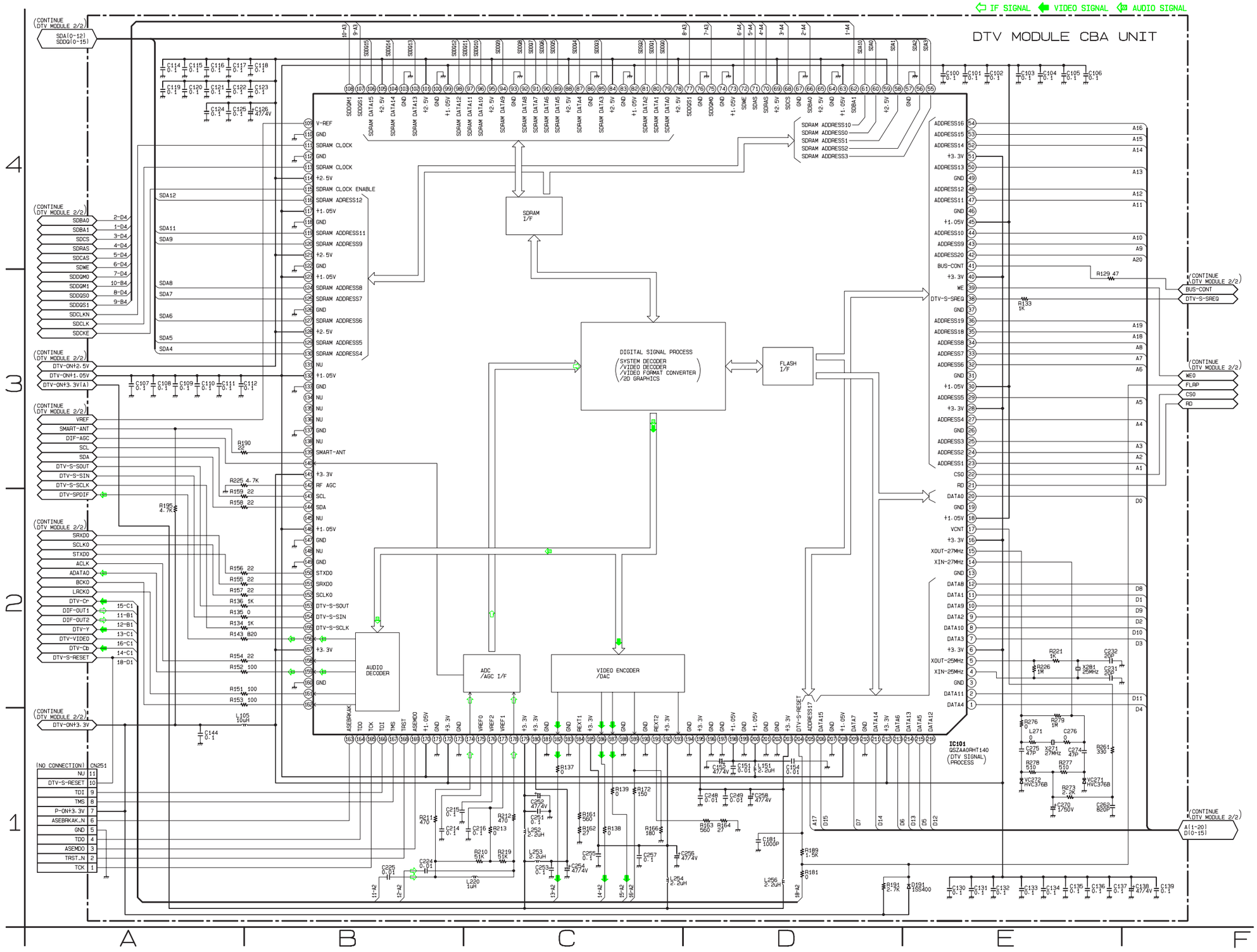
NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.



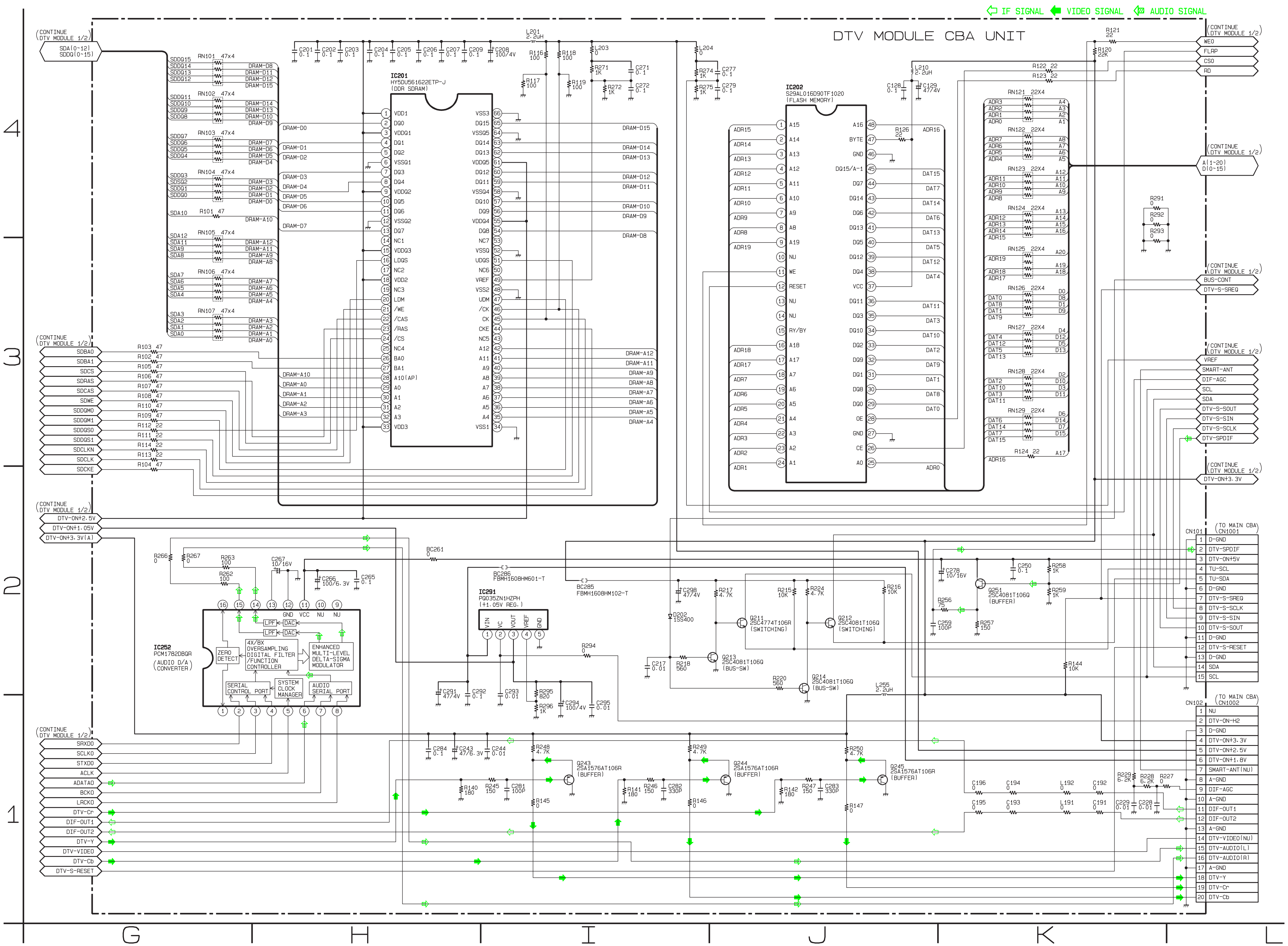
Sub Schematic Diagram < TV Section >



DTV Module 1/2 Schematic Diagram < TV Section >



DTV Module 2/2 Schematic Diagram < TV Section >


IF SIGNAL
VIDEO SIGNAL
AUDIO SIGNAL
DTV MODULE CBA UNIT
IC201
HY5DU561622ETP-J
(DDR SDRAM)
IC202
S29AL016D90TF1020
(FLASH MEMORY)
IC252
PCM1782DBQR
(AUDIO D/A CONVERTER)
ZERO DETECT
4X/8X OVERSAMPLING DIGITAL FILTER /FUNCTION CONTROLLER
ENHANCED MULTI-LEVEL DELTA-SIGMA MODULATOR
SERIAL CONTROL PORT
SYSTEM CLOCK MANAGER
AUDIO SERIAL PORT
LPF
DAC
IC291
PQ035ZN1HZPH
(+1.05V REG.)
Q211
2SC4774T106R
(SWITCHING)
Q212
2SC4081T106Q
(SWITCHING)
Q213
2SC4081T106Q
(BUS-SW)
Q214
2SC4081T106Q
(BUS-SW)
Q243
2SA1576AT106R
(BUFFER)
Q244
2SA1576AT106R
(BUFFER)
Q245
2SA1576AT106R
(BUFFER)
Q251
2SC4081T106Q
(BUFFER)
CONTINUE DTV MODULE 1/2
SDA(0~12)
SDDQ(0~15)
SDBA0
SDBA1
SDCS
SDRAS
SDCAS
SDWE
SDDQM0
SDDQM1
SDDQS0
SDDQS1
SDCLKN
SDCLK
SDCKE
DTV-ON+2.5V
DTV-ON+1.05V
DTV-ON+3.3V(A)
SRXD0
SCLK0
STXD0
ACLK
ADATA0
BCK0
LRCK0
DTV-Cr
DIF-OUT1
DIF-OUT2
DTV-Y
DTV-VIDEO
DTV-Cb
DTV-S-RESET
WE0
FLAP
CS0
RD
A(1~20)
D(0~15)
BUS-CONT
DTV-S-SREQ
VREF
SMART-ANT
DIF-AGC
SCL
SDA
DTV-S-SOUT
DTV-S-SIN
DTV-S-SCLK
DTV-SPDIF
DTV-ON+3.3V
CN101 (TO MAIN CBA CN1001)
1 D-GND
2 DTV-SPDIF
3 DTV-ON+5V
4 TU-SCL
5 TU-SDA
6 D-GND
7 DTV-S-SREQ
8 DTV-S-SCLK
9 DTV-S-SIN
10 DTV-S-SOUT
11 D-GND
12 DTV-S-RESET
13 D-GND
14 SDA
15 SCL
CN102 (TO MAIN CBA CN1002)
1 NU
2 DTV-ON-H2
3 D-GND
4 DTV-ON+3.3V
5 DTV-ON+2.5V
6 DTV-ON+1.8V
7 SMART-ANT(NU)
8 A-GND
9 DIF-AGC
10 A-GND
11 DIF-OUT1
12 DIF-OUT2
13 A-GND
14 DTV-VIDEO(NU)
15 DTV-AUDIO(L)
16 DTV-AUDIO(R)
17 A-GND
18 DTV-Y
19 DTV-Cr
20 DTV-Cb
G
H
I
J
K
L
1
2
3
4

VOLTAGE CHART

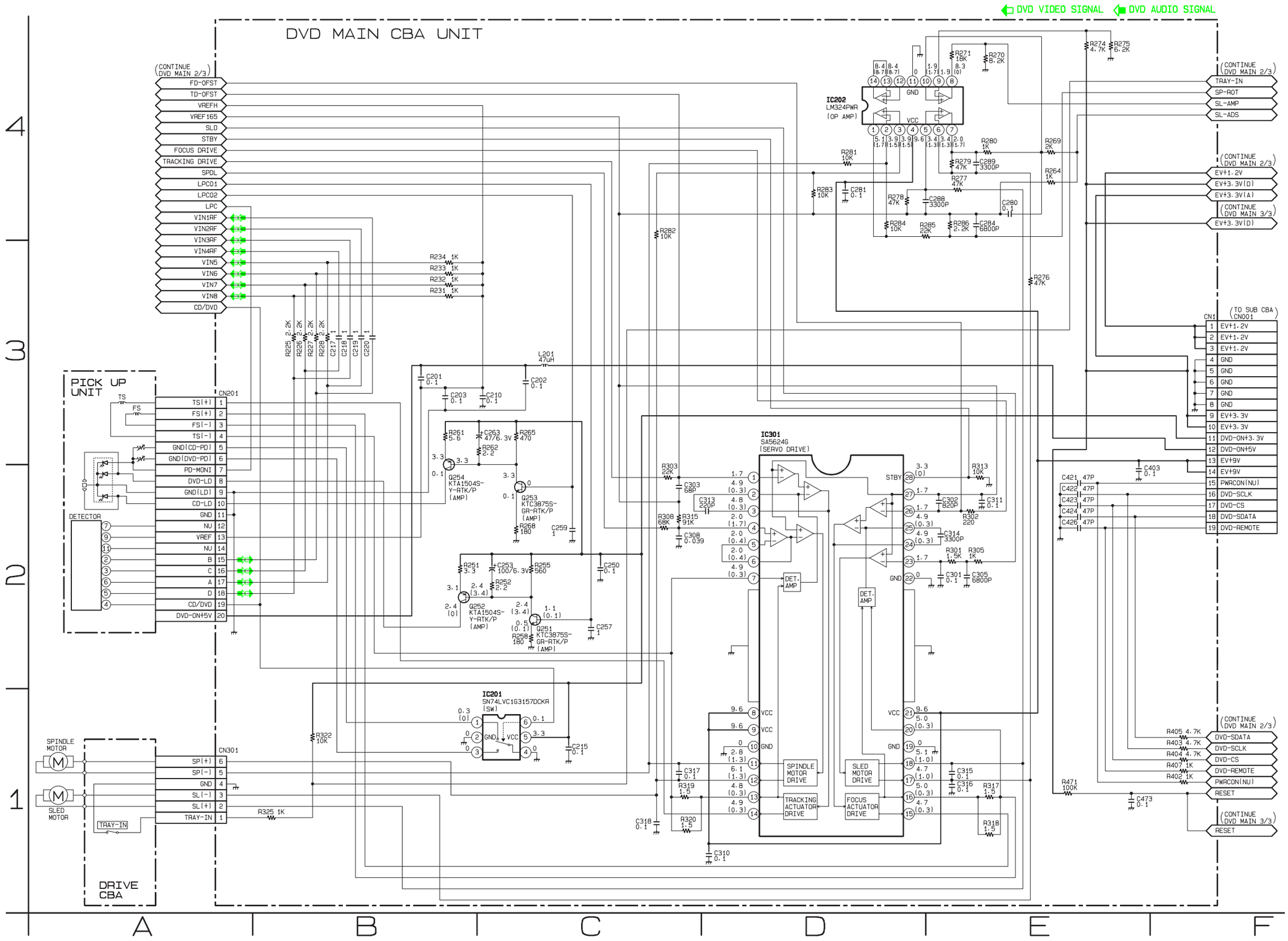
CN101

Pin No.	Voltage
1	0
2	1.9
3	5.2
4	3.4
5	3.4
6	0
7	2.8
8	3.2
9	3.3
10	0.2
11	0
12	3.4
13	0
14	3.2
15	3.2

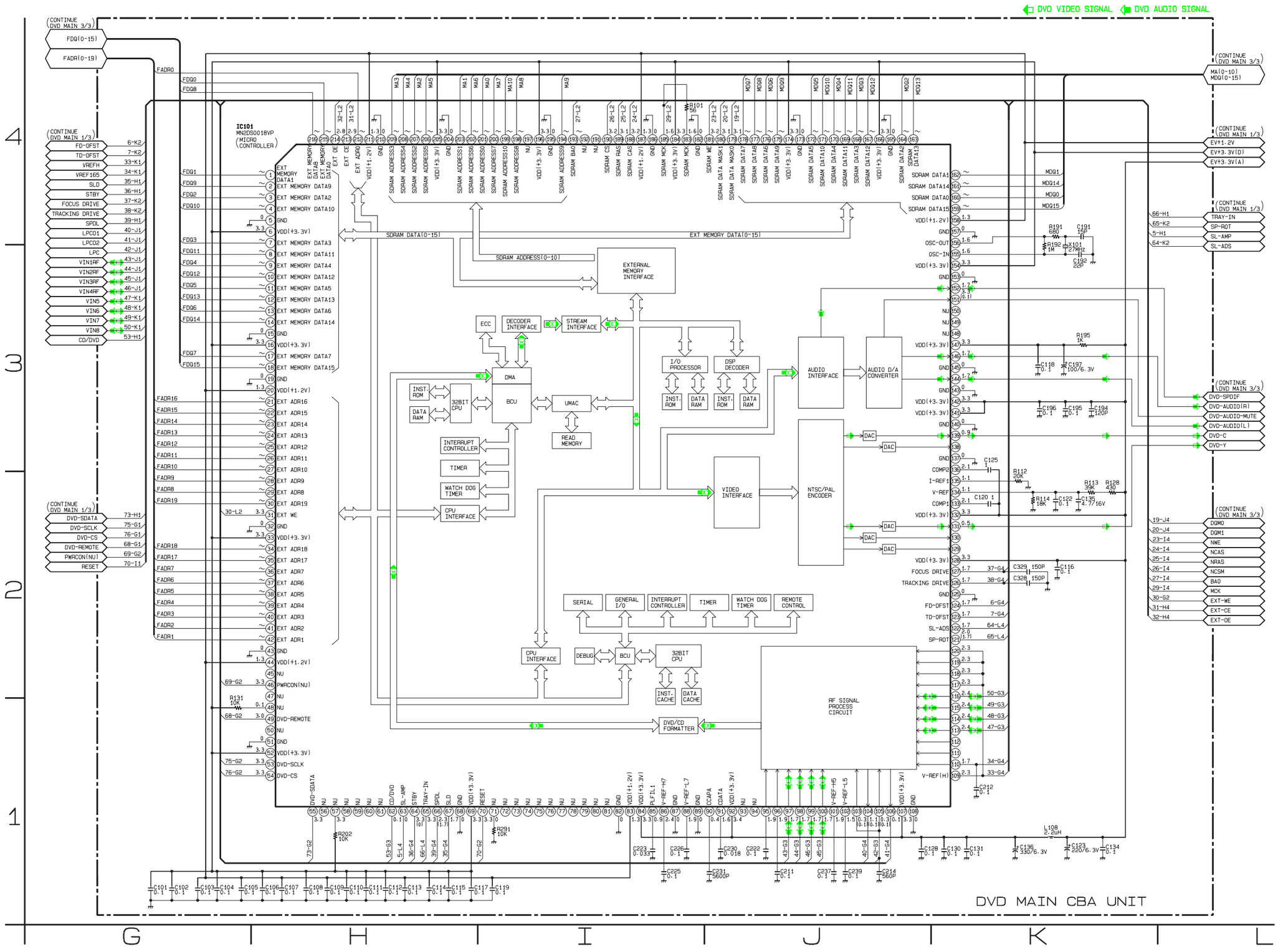
CN102

Pin No.	Voltage
1	---
2	4.9
3	0
4	3.4
5	2.6
6	1.9
7	---
8	0
9	1.7
10	0
11	0
12	0
13	0
14	---
15	2.6
16	2.5
17	0
18	~
19	~
20	~

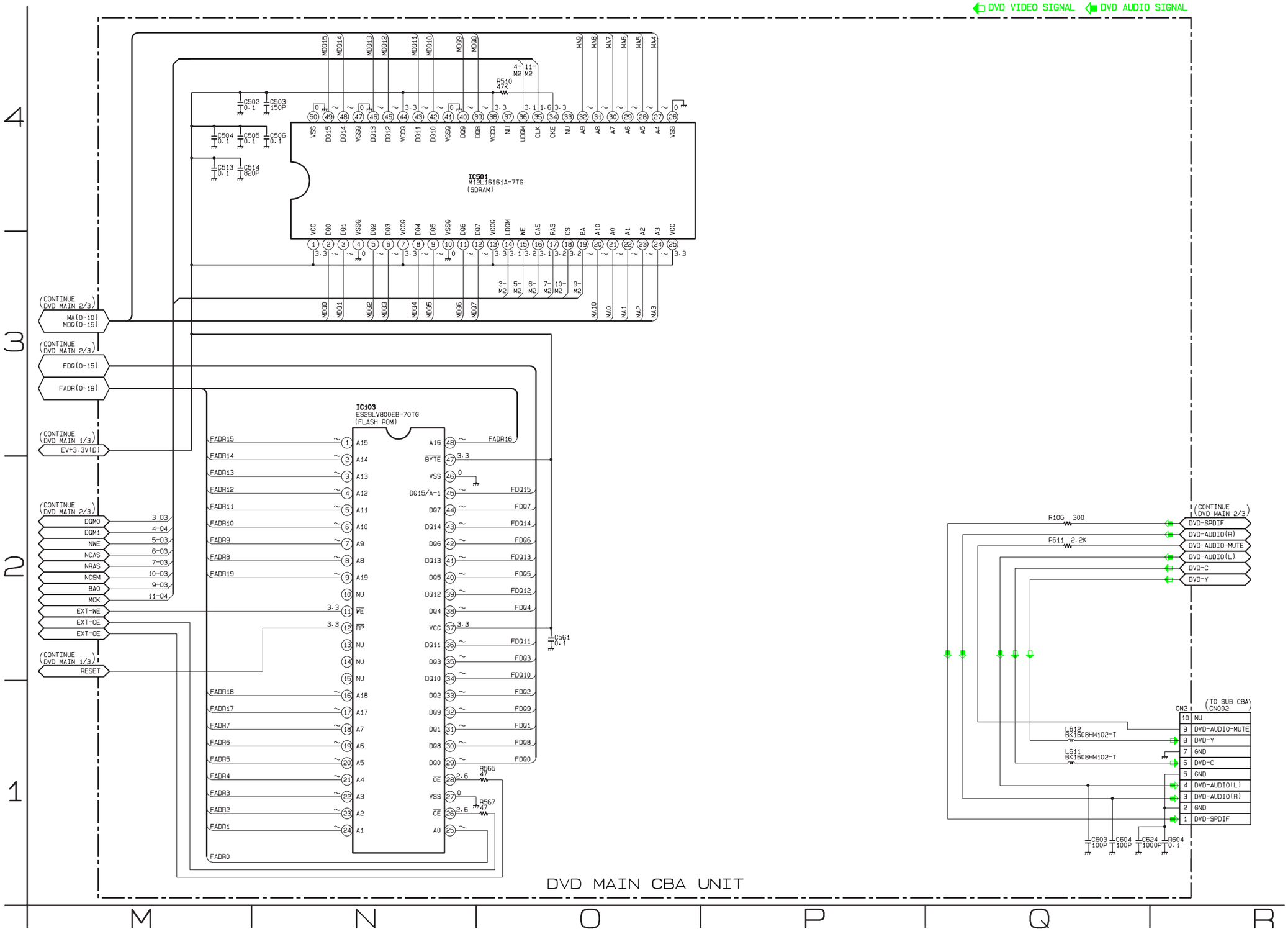
DVD Main 1/3 Schematic Diagram < DVD Section >



DVD Main 2/3 Schematic Diagram < DVD Section >



DVD Main 3/3 Schematic Diagram < DVD Section >



P7450SCD3

Main CBA Top View < TV Section >

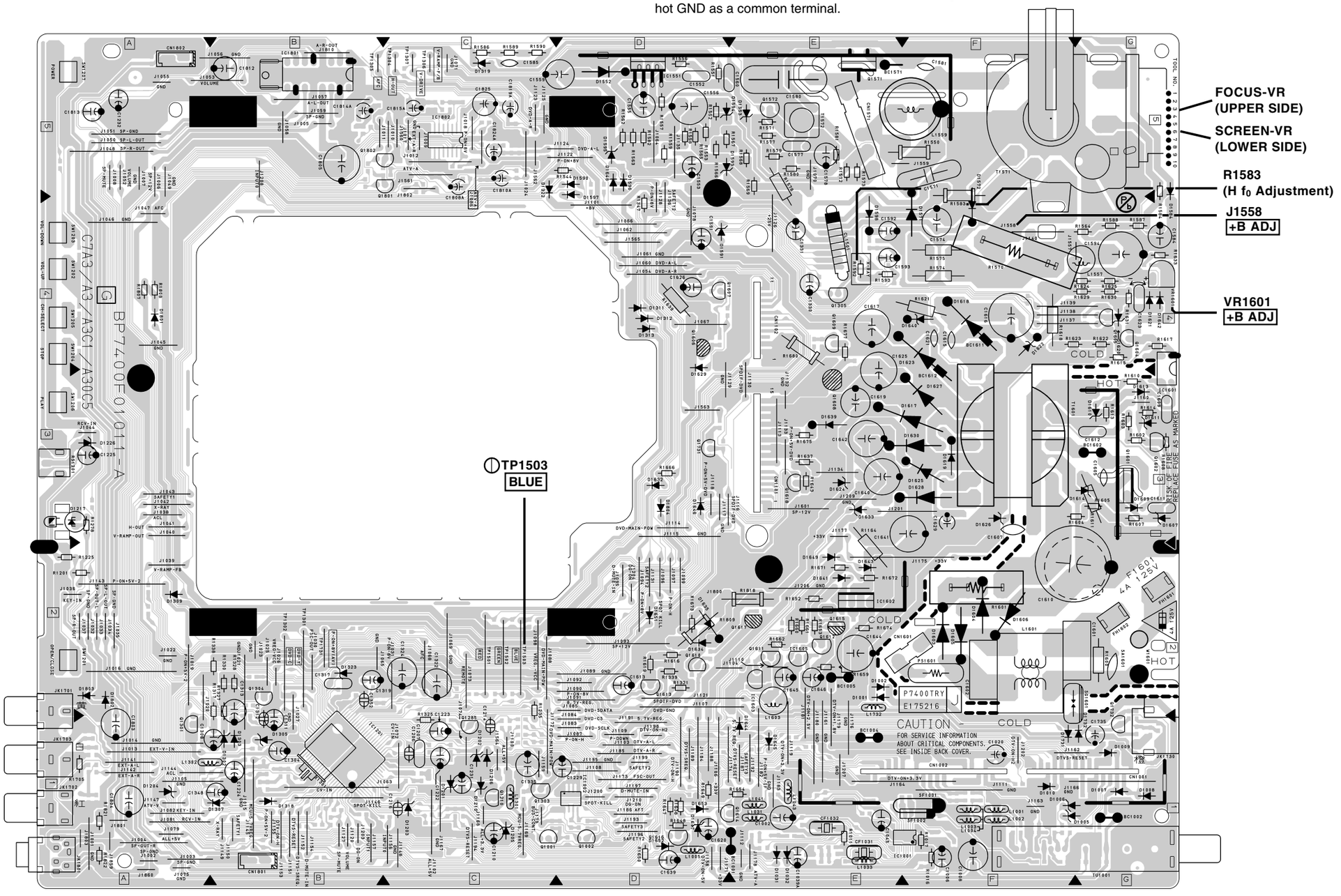
CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F1601) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

4A 125V

CAUTION ! : For continued protection against risk of fire, replace only with same type 4 A, 125V fuse.
ATTENTION : Utiliser un fusible de rechange de même type de 4A, 125V.

NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

Because a hot chassis ground is present in the power supply circuit, an isolation transformer must be used. Also, in order to have the ability to increase the input slowly,when troubleshooting this type power supply circuit, a variable isolation transformer is required.



Main CBA Bottom View < TV Section >

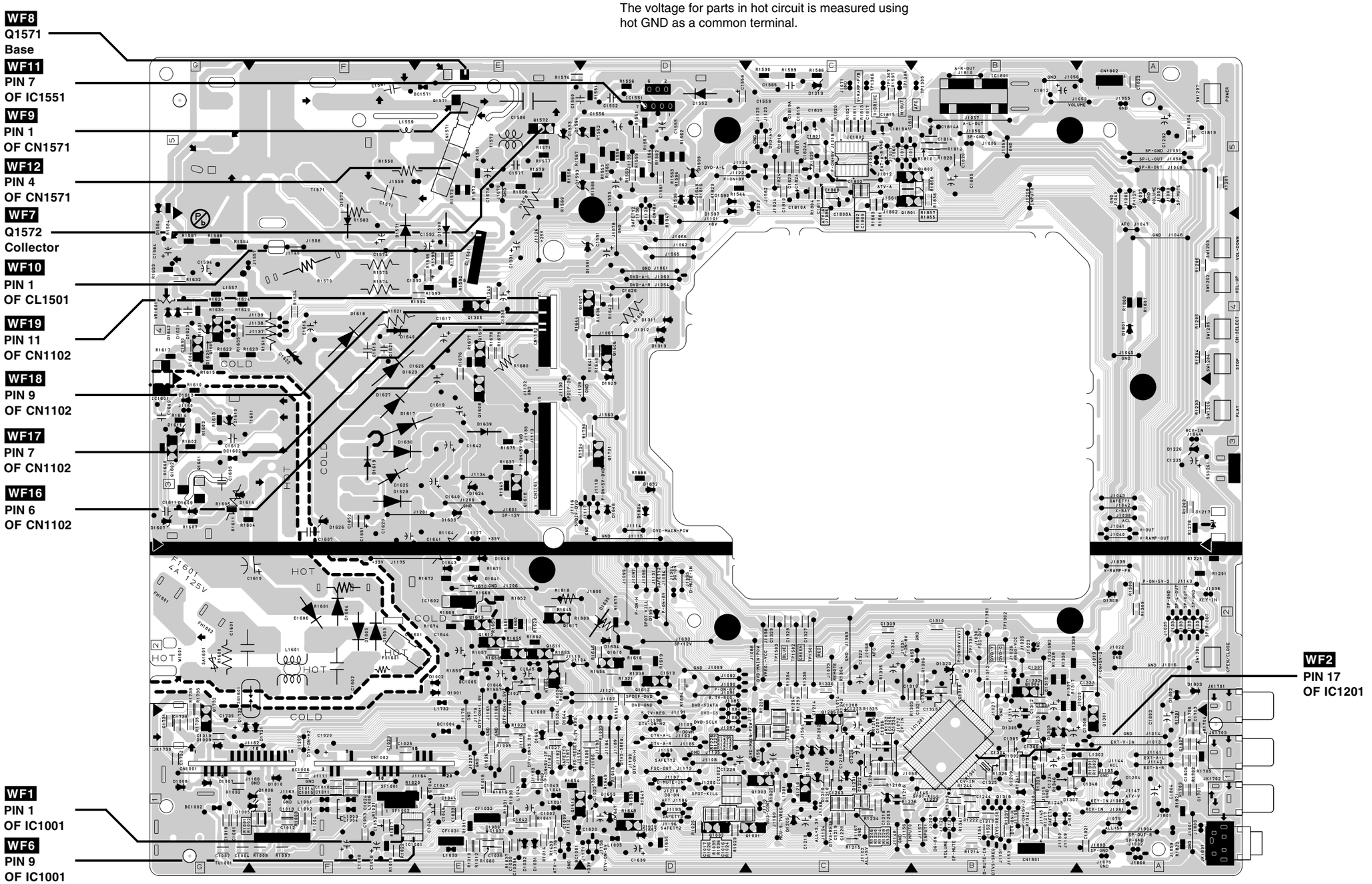
CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F1601) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

4A 125V

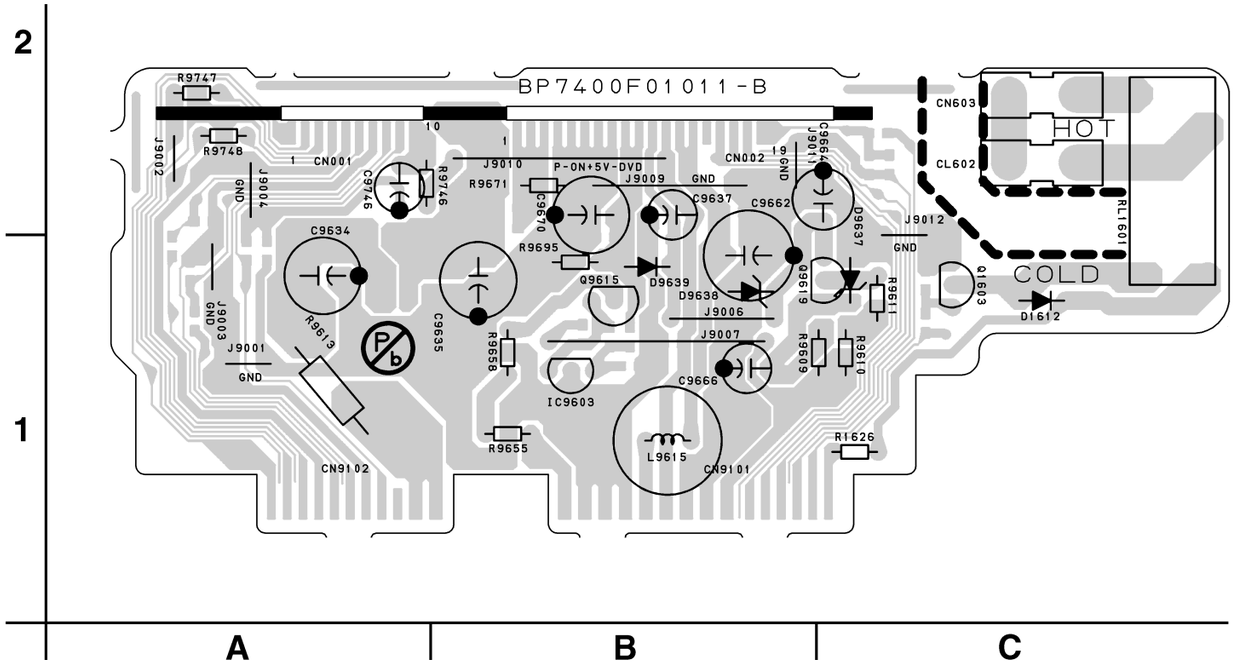
CAUTION ! : For continued protection against risk of fire, replace only with same type 4 A, 125V fuse.
ATTENTION : Utiliser un fusible de rechange de même type de 4A, 125V.

NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

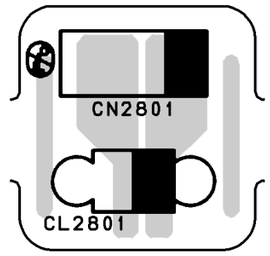
Because a hot chassis ground is present in the power supply circuit, an isolation transformer must be used. Also, in order to have the ability to increase the input slowly,when troubleshooting this type power supply circuit, a variable isolation transformer is required.



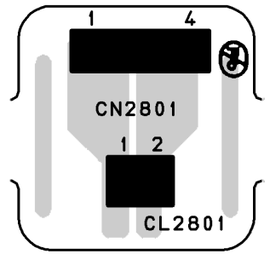
Sub CBA Top View < TV Section >



Junction-A CBA Top View < TV Section >

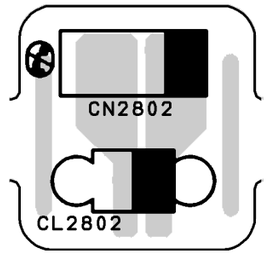


Junction-A CBA Bottom View < TV Section >

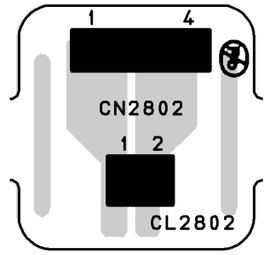


BP7400F01011-D

Junction-B CBA Top View < TV Section >

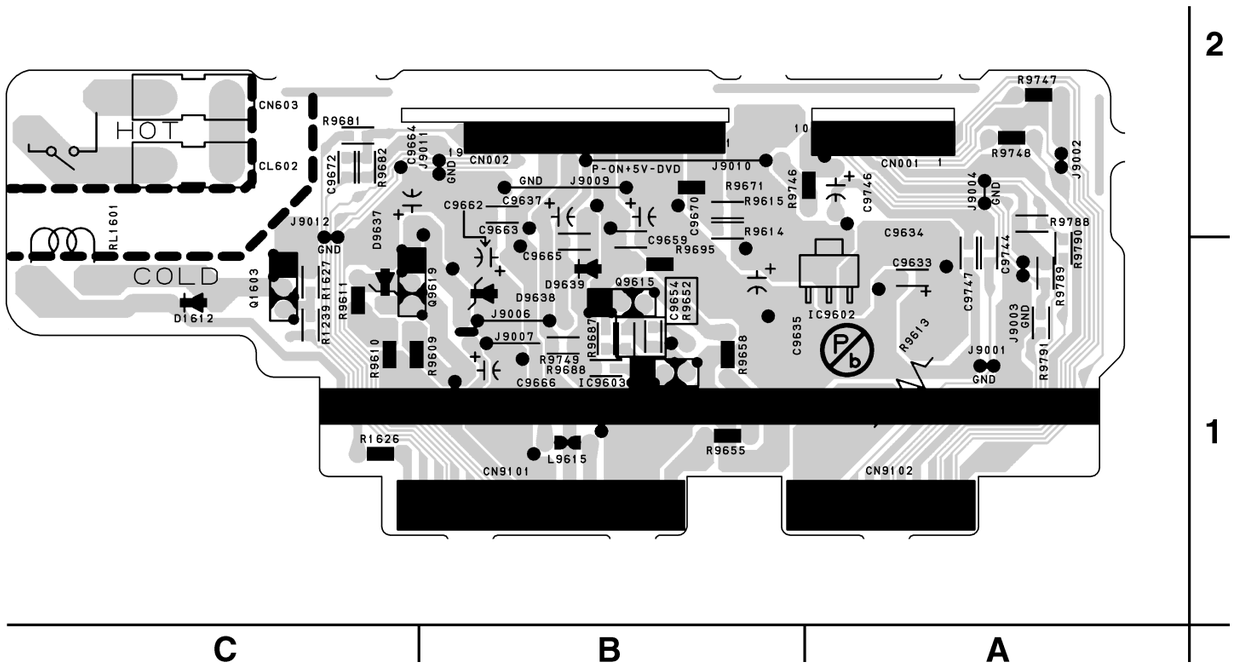


Junction-B CBA Bottom View < TV Section >



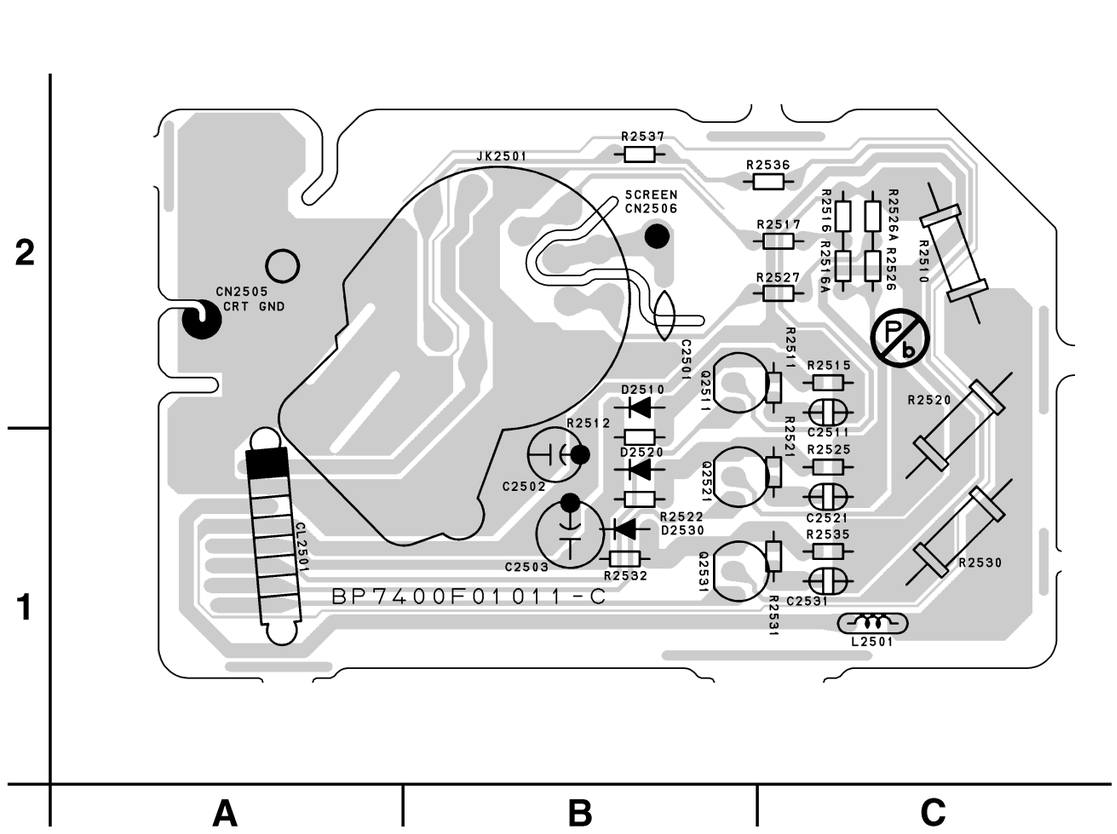
BP7400F01011-E

Sub CBA Bottom View < TV Section >

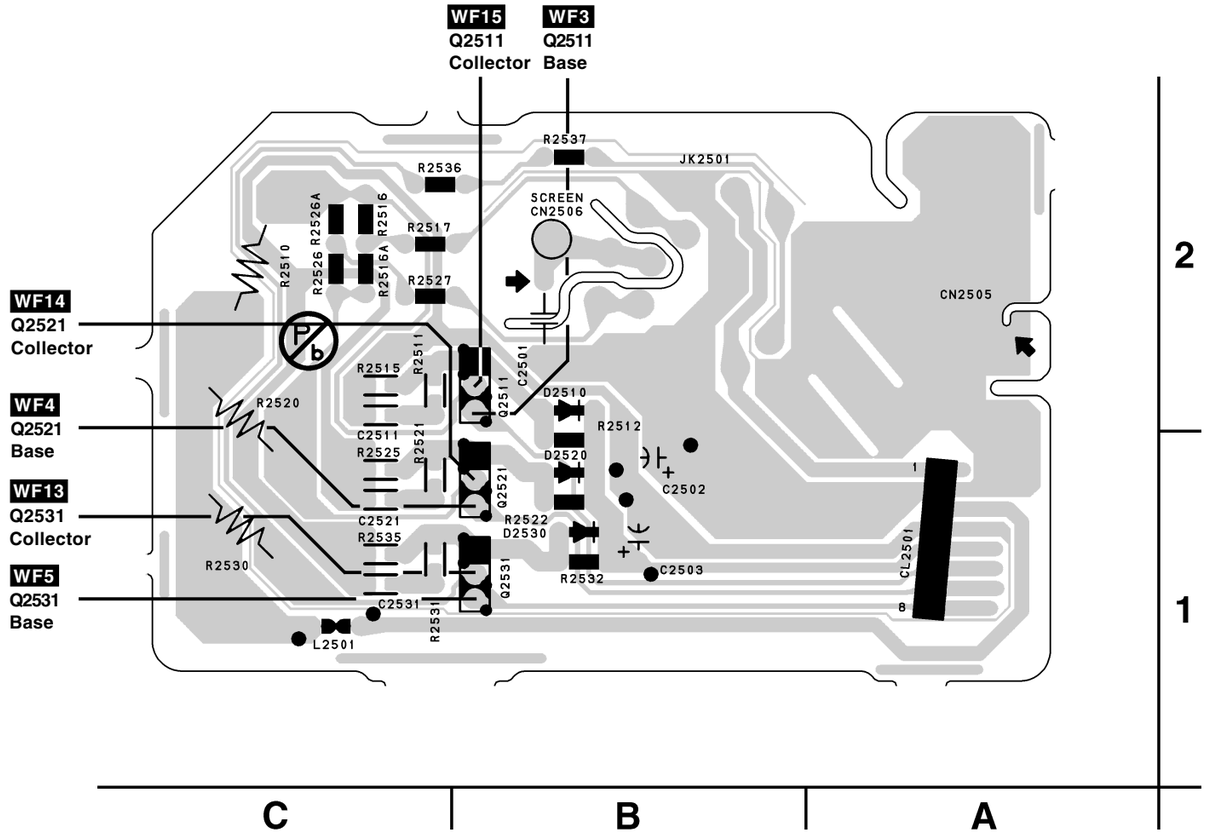


BP7400F01011-B

CRT CBA Top View < TV Section >

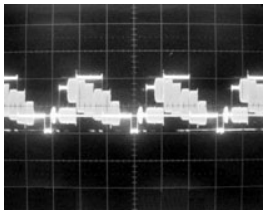


CRT CBA Bottom View < TV Section >

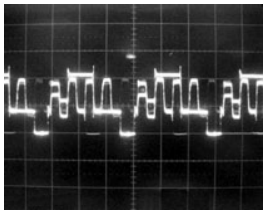


WAVEFORMS

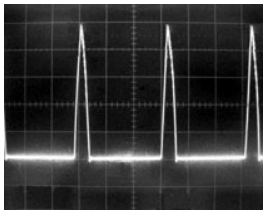
Input: NTSC Color Bar Signal (with 1kHz Audio Signal) --- WF1~WF15
DVD Video (Power on (Stop) MODE) --- WF16, WF17
CD (1KHz Play) --- WF18, WF19
INITIAL POSITION: Unplug unit from AC outlet for at least five minutes, reconnect to AC outlet and then turn power on.
(Brightness---Center Color---Center Tint---Center Contrast---Approx 70%)



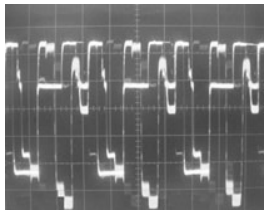
WF1 1DIV: 0.5V 20µs
IC1001 Pin 1



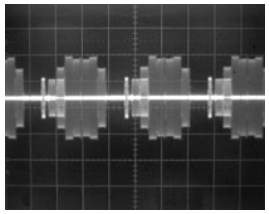
WF5 1DIV: 2V 20µs
Q2531 Base



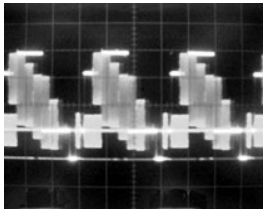
WF9 1DIV: 200V 20µs
CN1571 Pin 1



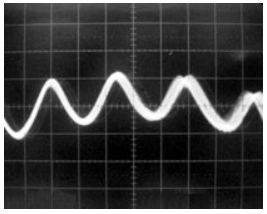
WF13 1DIV: 20V 20µs
Q2531 Collector



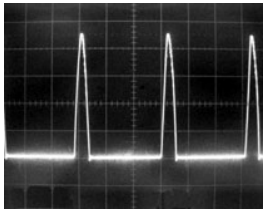
WF17 1DIV: 0.2V 20µs
CN1102 Pin 7



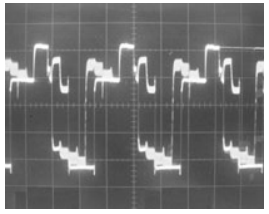
WF2 1DIV: 0.5V 20µs
IC1201 Pin 17



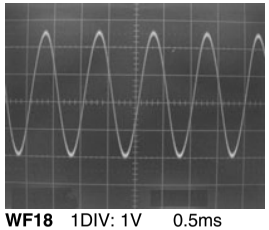
WF6 1DIV: 0.5V 5µs
IC1001 Pin 9



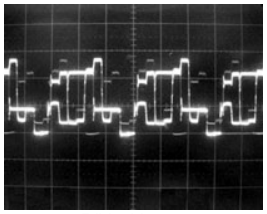
WF10 1DIV: 5V 20µs
CL1501 Pin 1



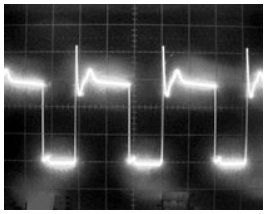
WF14 1DIV: 20V 20µs
Q2521 Collector



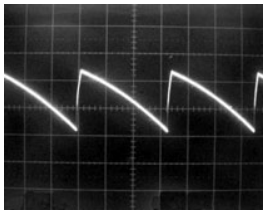
WF18 1DIV: 1V 0.5ms
CN1102 Pin 9



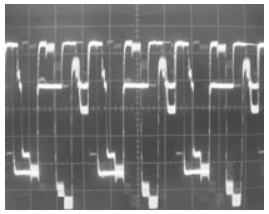
WF3 1DIV: 2V 20µs
Q2511 Base



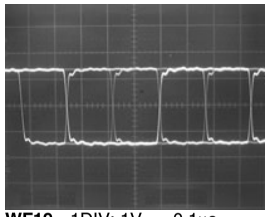
WF7 1DIV: 10V 20µs
Q1572 Collector



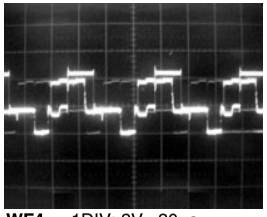
WF11 1DIV: 1V 5ms
IC1551 Pin 7



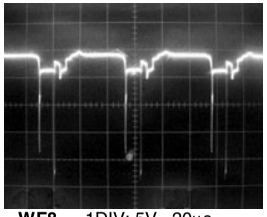
WF15 1DIV: 20V 20µs
Q2511 Collector



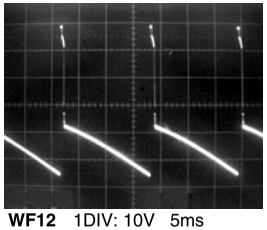
WF19 1DIV: 1V 0.1µs
CN1102 Pin 11



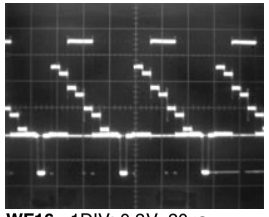
WF4 1DIV: 2V 20µs
Q2521 Base



WF8 1DIV: 5V 20µs
Q1571 Base

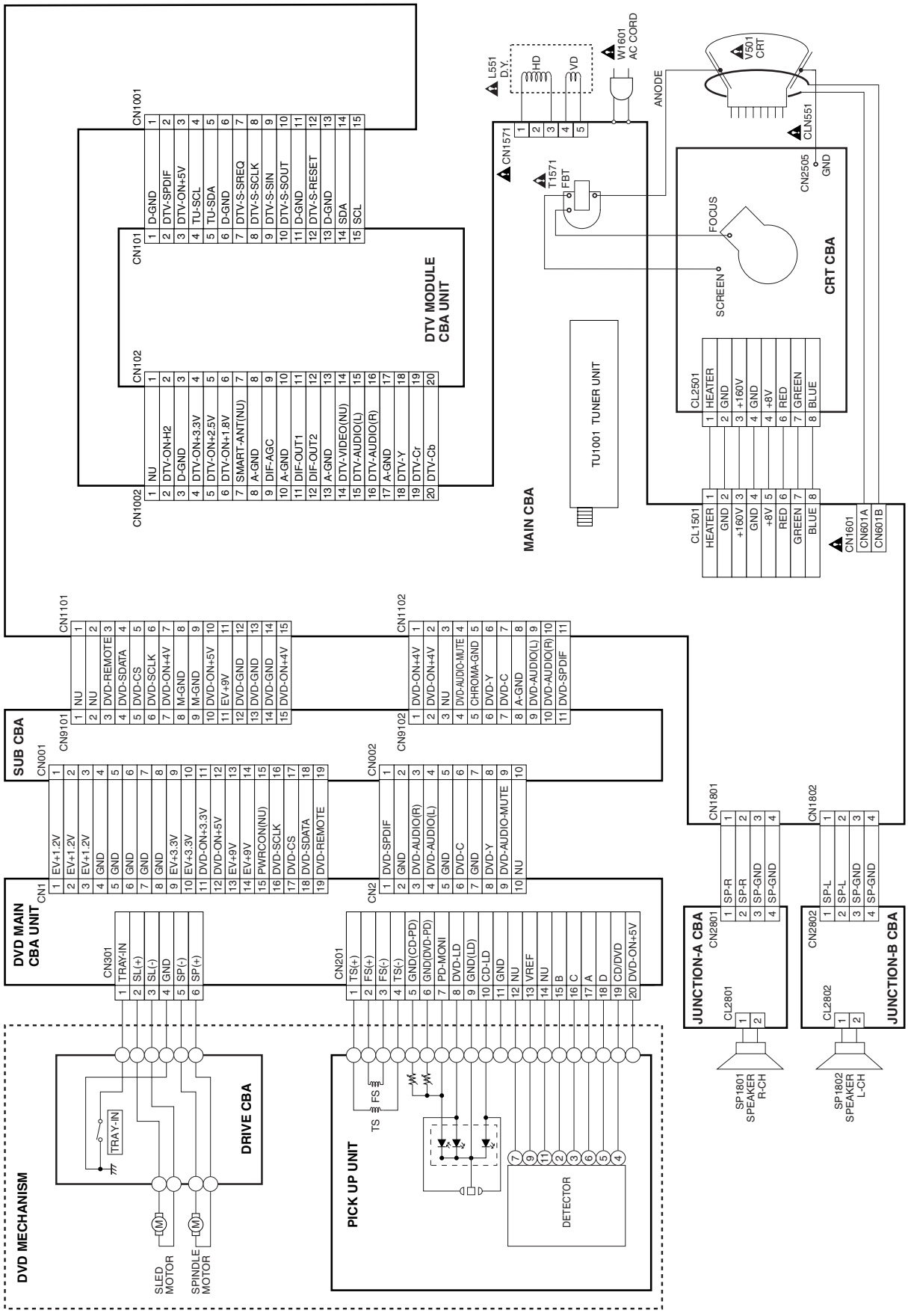


WF12 1DIV: 10V 5ms
CN1571 Pin 4



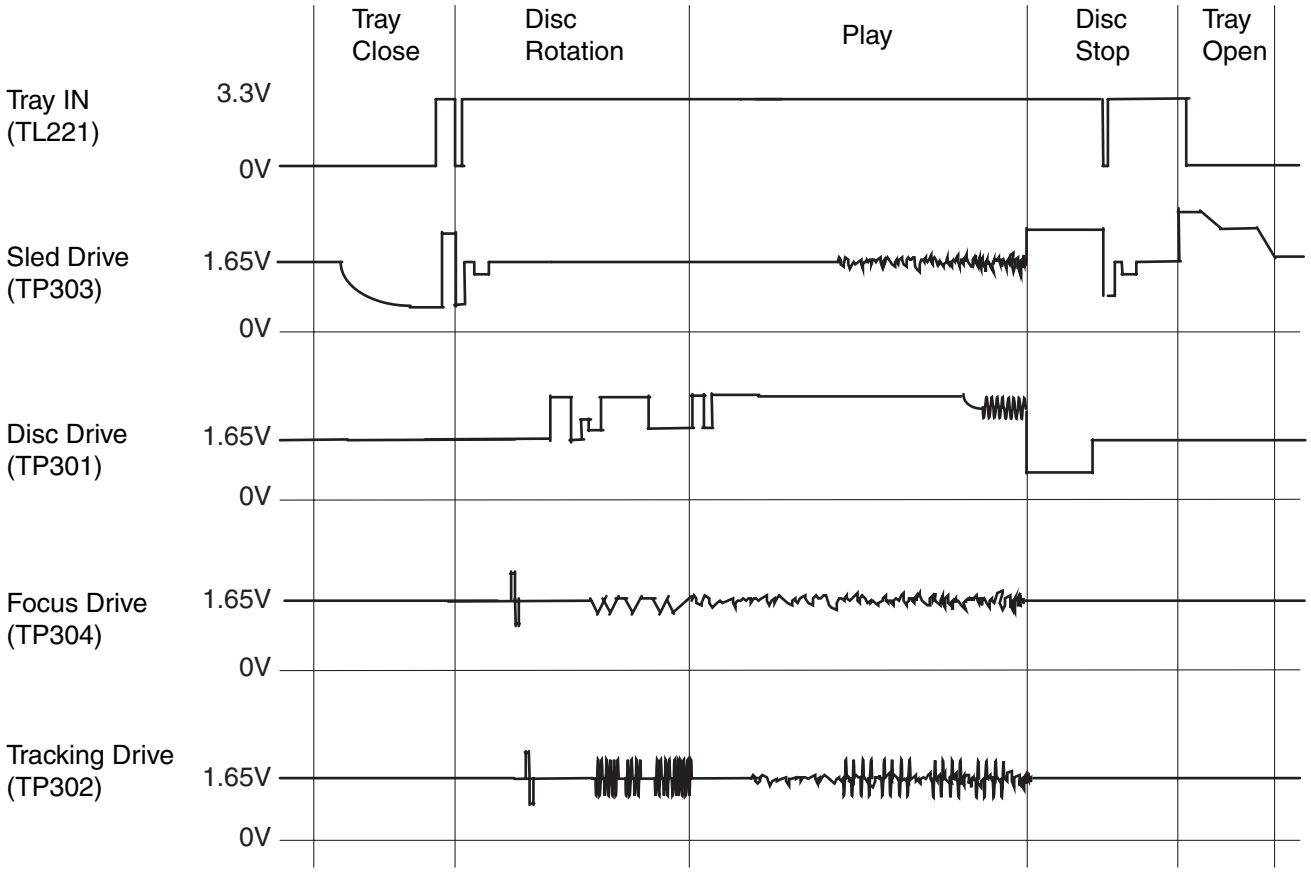
WF16 1DIV: 0.2V 20µs
CN1102 Pin 6

WIRING DIAGRAM



SYSTEM CONTROL TIMING CHARTS

Tray Close ~ Play / Play ~ Tray Open



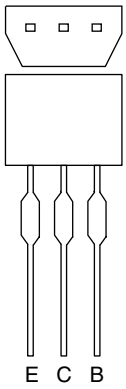
IC PIN FUNCTION DESCRIPTIONS

IC1201 (TV Micro Controller)

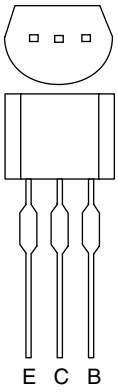
Pin No.	Signal Name	Function
1	INPUT-1	Input Select 1 Signal Output
2	NU	Not Used
3	VOLUME	Volume Control Signal Output
4	SP-MUTE	Audio Mute Signal
5	TEST0	GND
6	SAFETY-1	Power Supply Protection 1
7	X-RAY	X-RAY Protect
8	REMOTE-IN	Remote Control Signal Input
9	KEY-IN	Key Input
10	DVD-AUDIO-MUTE	DVD Audio Mute Signal
11	DTV-S-SREQ	DTV Serial Request
12	DTV-S-RESET	DTV Reset
13	DTV-ON-H	DTV On Signal at High
14	NU	Not Used
15	GND	GND
16	ACL	Automatic Contrast Limiter
17	Y-SW OUT	Composite Video Signal Output
18	XTAL	Crystal Oscillation(3.58MHz)
19	C-APC	Chrominance APC
20	MCU +5.7V REG.OUT	+5.7V Regulator Control Signal Output
21	NU	Not Used
22	VCC	VCC
23	CVBS-IN2	Composite Video Signal 2 Input
24	GND	GND
25	DTV-Y-IN	DTV Y Signal Input
26	DTV-Cb-IN	DTV Cb Signal Input
27	DTV-Cr-IN	DTV Cr Signal Input
28	+5.7V REG.OUT	+5.7V Regulator Control Signal Output
29	DVD-C-IN	DVD Chrominance Signal Input
30	DVD-Y-IN	DVD Luminance Signal Input
31	VCC	VCC
32	FSC-OUT	Clock Output
33	NU	Not Used
34	NU	Not Used
35	CVBS-IN1	Composite Video Signal 1 Input
36	V-RAMP-F/B	Vertical Ramp Feed Back
37	V-DRIVE	Vertical Ramp Output
38	V-RAMP-CAP	Vertical Ramp OSC Capacitor
39	+8.7V REG.OUT	+8.7V Regulator Control Signal Output
40	H VCO F/B	Horizontal Vco Feed Back
41	AFC FILT	Horizontal AFC Filter
42	GND	GND
43	AFC	AFC
44	H-DRIVE	Horizontal Pulse Output
45	VCC	VCC
46	VCC	VCC
47	R-OUT	Red Signal Output
48	G-OUT	Green Signal Output
49	B-OUT	Blue Signal Output
50	NU	Not Used
51	DVD-REMOTE-OUT	DVD Remote Control Signal Output
52	DVD-SDATA	DVD Interface Serial Data
53	DVD-CS	DVD Interface Chip Select
54	DVD-SCLK	DVD Interface Serial Clock
55	P-ON-H	Power On Signal at High
56	RESET	Reset
57	DTV-S-SCLK	DTV Serial Clock
58	DTV-S-SIN	DTV Serial Data In
59	DTV-S-SOUT	DTV Serial Data Out
60	HLF	Horizontal Filter
61	VHOLD	Vertical Hold
62	CV-IN	Composite Video Signal Input
63	AFT	AFT Voltage Input
64	SAFETY-3	Power Supply Protection 3
65	DVD-MAIN-POWER	Power On Signal at High for DVD
66	GND	GND
67	NU	Not Used
68	NU	Not Used
69	GND	GND
70	FILT	Filter
71	VCC	VCC
72	NU	Not Used
73	SAFETY-2	Power Supply Protection 2
74	DTV-ON-H2	DTV On Signal 2 at High
75	NU	Not Used

Pin No.	Signal Name	Function
76	BUS-CONT	BUS Control
77	SCL	Serial Clock
78	I2C-OPEN	Chip Select
79	SDA	Serial Data
80	INPUT-0	Input Select Signal Output

LEAD IDENTIFICATIONS



KTC3199-GR-AT/P
KTA1281Y-AT/P



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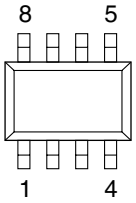
2SC1627-Y(TE2.F.T)
2SC2120-O(TE2 F T)
2SC2482

M24128-BWMN6TP



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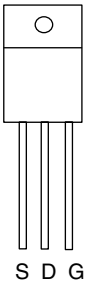

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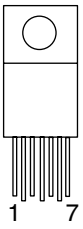

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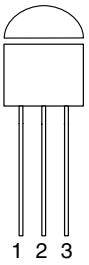

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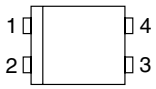

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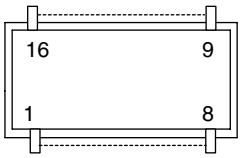

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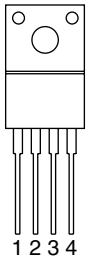

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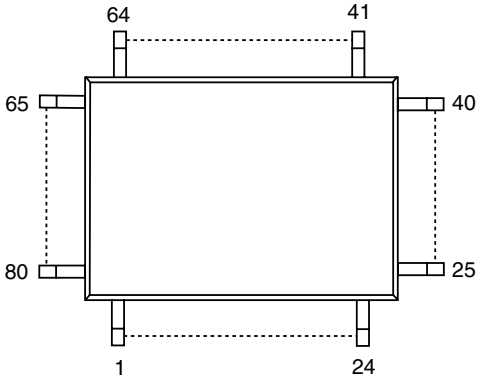

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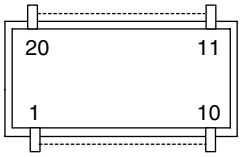

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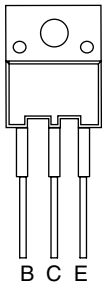

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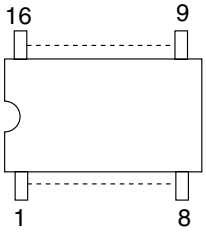

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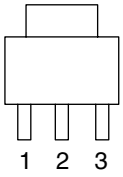
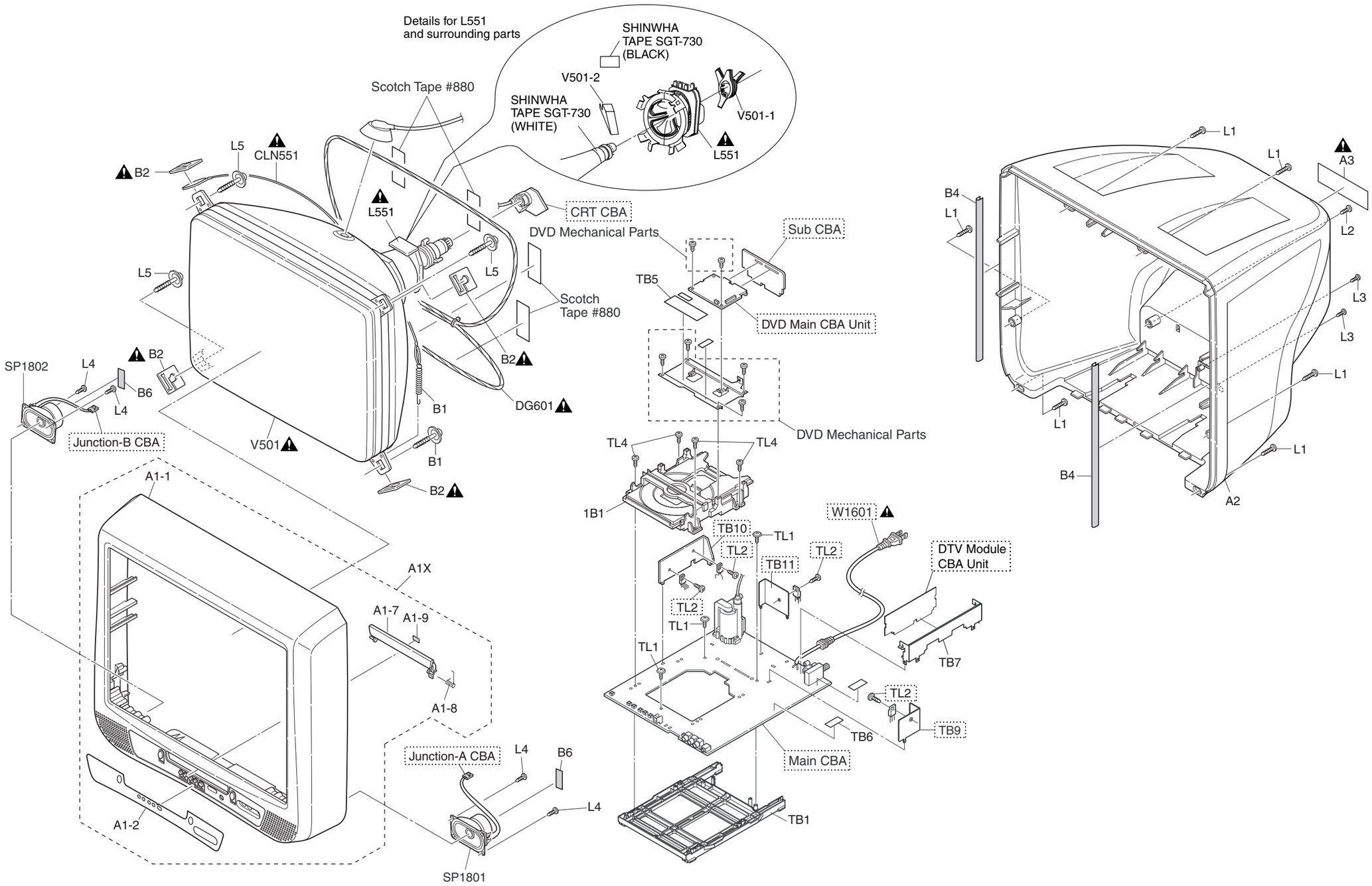


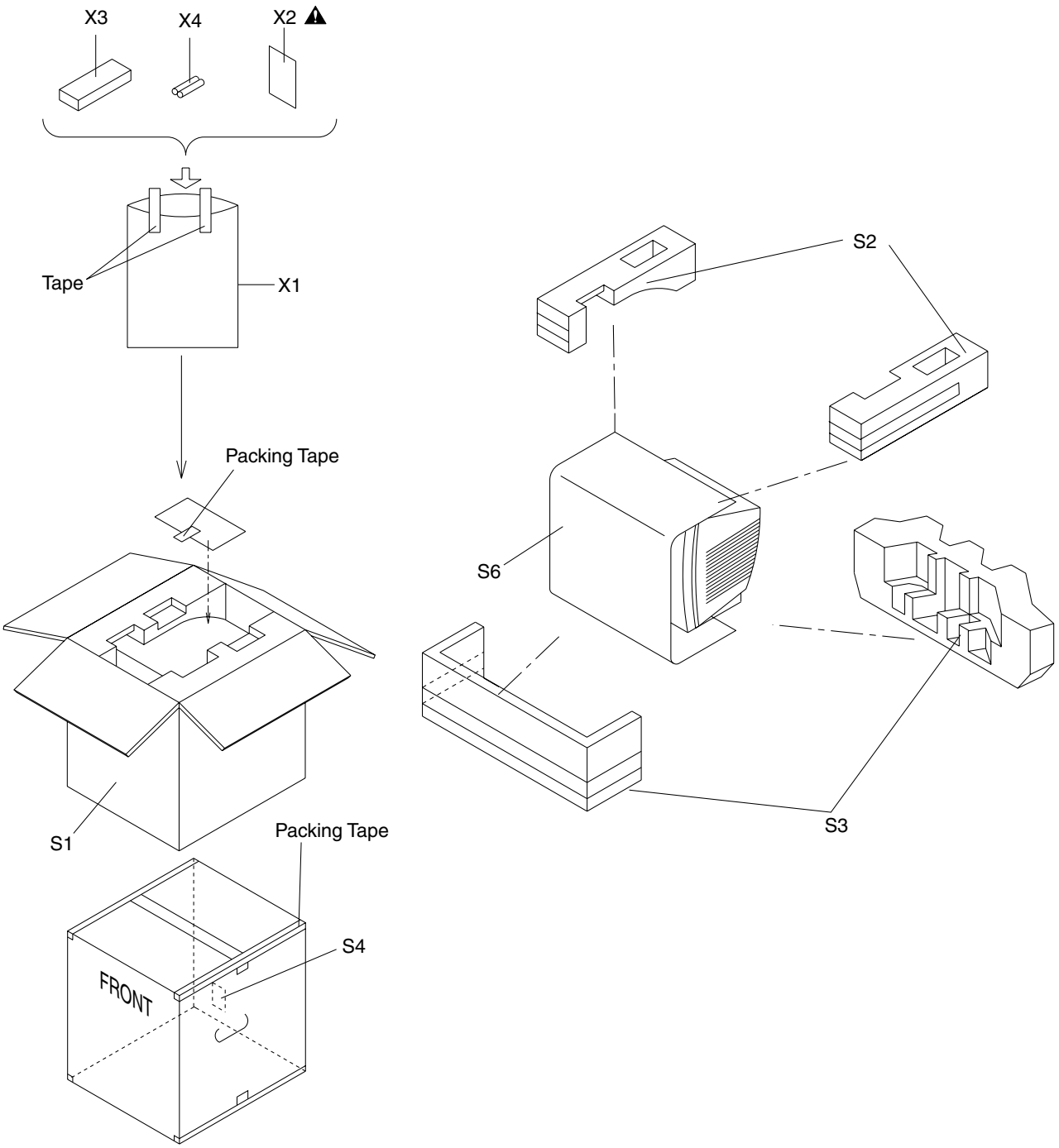
Note:
A: Anode
K: Cathode
E: Emitter
C: Collector
B: Base
R: Reference
S: Source
G: Gate
D: Drain

EXPLODED VIEWS

Cabinet



Packing



MECHANICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

NOTE: Parts that are not assigned part numbers (---------) are not available.

Ref. No.	Description	Part No.
A1X	FRONT CABINET ASSEMBLY P7450UM	1EM121796
A1-1	FRONT CABINET P7450UM	1EM121815
A1-2	CONTROL PLATE P7450UM	1EM322464
A1-7	TRAY PANEL T8200UA	1EM220744
A1-8	TRAY SPRING TD707UH	0EM408552
A1-9	CLOTH(B) L5201U0 15X10X1.0T	0EM400076
A2	REAR CABINET P7450UM	1EM021578
A3⚠	RATING LABEL P7450UM	---------
1B1	DVD MECHA X7 SINGLE N79U0KVM	N79U0KVM
B1	TENSION SPRING P77B0UT	1EM424298
B2⚠	DEGAUSS HOLDER L2401UB	1EM420205
B4	CLOTH 190X15XT0.5	TS7623
B6	CLOTH(10X30XT0.5) B5900UA	0EM404486
CLN551⚠	WIRE ASSEMBLY CRT GND 620MM	WX1T9200-006
DG601⚠	DEGAUSSING COIL F-054	LLBH00ZTM054
L1	SCREW P-TIGHT 4X18 BIND HEAD +	GBJP4180
L2	SCREW TAPPING M4X14	DBT14140
L3	SCREW P-TIGHT 3X10 BIND HEAD+	GBHP3100
L4	SCREW P-TIGHT 3X10 BIND HEAD+	GBJP3100
L5	SCREW L1500UA	0EM406142A
L551⚠	DEFLECTION YOKE (PB FREE) CDY-MM2102A1	LLBY00Z0X011
SP1801	SPEAKER S0407F01A	DSD0807XQ001
SP1802	SPEAKER S0407F01A	DSD0807XQ001
TB1	TRAY CHASSIS P7400UZ	1EM021564
TB5	LASER CAUTION LABEL T8200UA	---------
TB6	20PF CHASSIS NO. LABEL TJ P7450UM	---------
TB7	MODULE PCB HOLDER P7150UT	1EM322373A
TL1	SCREW P-TIGHT M3*10 WASHERHEAD+	GCJP3100
TL4	SCREW P-TIGHT 3X16 BIND HEAD +	GBJP3160
V501⚠	CRT A51LYX996X	TCRT190MS015
V501-1	C.P.MAGNET JH225-FN-00	XM04000BV003
V501-2	WEDGE FT-00110W	XV10000T4001
PACKING		
S1	CARTON P7450UM	1EM424032
S2	STYROFOAM TOP ASSEMBLY P7450UM	1EM424027
S3	STYROFOAM BOTTOM ASSEMBLY P7450UM	1EM424028
S4	SERIAL NO. LABEL P7450UM	---------
S6	SET SHEET B7500UA 1000X1700	0EM402178
ACCESSORIES		
X1	BAG POLYETHYLENE 235X365XT0.03	0EM408420A
X2⚠	OWNERS MANUAL P7450UM	1EMN22092
X3	REMOTE CONTROL NF107UD 144/ECNX801/ NF107UD	NF107UD
X4	DRY BATTERY(SUNRISE) R6SSE/2S	XB0M451MS002

ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

NOTES:

1. Parts that are not assigned part numbers (---------) are not available.
2. Tolerance of Capacitors and Resistors are noted with the following symbols.

C.....±0.25% D.....±0.5% F.....±1%

G.....±2% J.....±5% K.....±10%

M.....±20% N.....±30% Z.....+80/-20%

DTV MODULE CBA UNIT

Ref. No.	Description	Part No.
	DTV MODULE CBA UNIT	1ESA13968

DVD MAIN CBA UNIT

Ref. No.	Description	Part No.
	DVD MAIN CBA UNIT	N7CU5KUP

MMA CBA

Ref. No.	Description	Part No.
	MMA CBA Consists of the following	1ESA13838
	MAIN CBA SUB CBA CRT CBA JUNCTION-A CBA JUNCTION-B CBA	---------- ---------- ---------- ---------- ----------

MAIN CBA

Ref. No.	Description	Part No.
	MAIN CBA Consists of the following:	----------
	CAPACITORS	
C1002	ELECTROLYTIC CAP. 330μF/6.3V M	CE0KMASDL331
C1006	ELECTROLYTIC CAP. 1μF/50V M	CE1JMASDL1R0
C1007	CHIP CERAMIC CAP.(1608) B K 1000pF/50V	CHD1JK30B102
C1008	ELECTROLYTIC CAP. 330μF/10V M	CE1AMASDL331
C1009	CHIP CERAMIC CAP.(1608) F Z 0.1μF/50V	CHD1JZ30F104
C1012	CHIP CERAMIC CAP.(1608) B K 1000pF/50V	CHD1JK30B102
C1013	CHIP CERAMIC CAP. F Z 0.01μF/50V	CHD1JZ30F103
C1014	CHIP CERAMIC CAP.(1608) CH J 47pF/50V	CHD1JJ3CH470
C1015	CHIP CERAMIC CAP.(1608) CH J 47pF/50V	CHD1JJ3CH470
C1016	CHIP CERAMIC CAP.(1608) CH J 68pF/50V	CHD1JJ3CH680
C1017	CHIP CERAMIC CAP.(1608) CH J 68pF/50V	CHD1JJ3CH680
C1018	CHIP CERAMIC CAP.(1608) B K 1000pF/50V	CHD1JK30B102
C1020	ELECTROLYTIC CAP. 100μF/6.3V H7	CE0KMAVSL101
C1021	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1023	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1025	CHIP CERAMIC CAP.(1608) CH J 100pF/50V	CHD1JJ3CH101
C1026	CHIP CERAMIC CAP.(1608) CH J 100pF/50V	CHD1JJ3CH101
C1033	CHIP CERAMIC CAP.(1608) B K 0.01μF/50V	CHD1JK30B103
C1036	CHIP CERAMIC CAP.(1608) B K 1000pF/50V	CHD1JK30B102
C1037	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1039A	ELECTROLYTIC CAP. 1μF/50V M	CE1JMASDL1R0
C1042	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1044	CHIP CERAMIC CAP.(1608) B K 0.01μF/50V	CHD1JK30B103
C1047	CHIP CERAMIC CAP.(1608) B K 0.01μF/50V	CHD1JK30B103
C1049	CHIP CERAMIC CAP.(1608) B K 0.01μF/50V	CHD1JK30B103
C1052	CHIP CERAMIC CAP.(1608) B K 0.047μF/50V	CHD1JK30B473
C1053	CHIP CERAMIC CAP. B K 0.018μF/50V	CHD1JK30B183
C1204	CHIP CERAMIC CAP.(1608) B K 0.015μF/50V	CHD1JK30B153
C1205	CHIP CERAMIC CAP.(1608) B K 1000pF/50V	CHD1JK30B102
C1206	CERAMIC CAP.(AX) B K 220pF/50V	CCA1JKT0B221
C1207	FILM CAP.(P) 0.001μF/50V J	CMA1JJS00102
C1209	CHIP CERAMIC CAP.(1608) F Z 0.1μF/25V	CHD1EZ30F104
C1210	ELECTROLYTIC CAP. 47μF/25V M	CE1EMASDL470
C1217	CHIP CERAMIC CAP. F Z 0.01μF/50V	CHD1JZ30F103
C1222	ELECTROLYTIC CAP. 1μF/50V M	CE1JMASDL1R0
C1223	ELECTROLYTIC CAP. 10μF/50V M	CE1JMASDL100
C1224	ELECTROLYTIC CAP. 1μF/50V M	CE1JMASDL1R0
C1225	ELECTROLYTIC CAP. 47μF/25V M	CE1EMASDL470
C1231	ELECTROLYTIC CAP. 100μF/10V M	CE1AMASDL101
C1232	ELECTROLYTIC CAP. 4.7μF/50V M	CE1JMASDL4R7
C1234	CHIP CERAMIC CAP. B K 560pF/50V	CHD1JK30B561
C1302	CHIP CERAMIC CAP.(1608) B K 0.01μF/50V	CHD1JK30B103
C1304	ELECTROLYTIC CAP. 100μF/10V M	CE1AMASDL101
C1306	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1307	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1308	ELECTROLYTIC CAP. 47μF/25V M	CE1EMASDL470
C1309	CHIP CERAMIC CAP.(1608) F Z 0.1μF/25V	CHD1EZ30F104
C1310	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1311	ELECTROLYTIC CAP. 100μF/16V M	CE1CMASDL101
C1313	ELECTROLYTIC CAP. 100μF/16V M	CE1CMASDL101
C1314	CHIP CERAMIC CAP. B K 470pF/50V	CHD1JK30B471
C1317	STACKED FILM CAP. 0.47μF/50V J	CMA1JJS00474
C1318	CHIP CERAMIC CAP.(1608) B K 0.01μF/50V	CHD1JK30B103
C1319	ELECTROLYTIC CAP. 2.2μF/50V M	CE1JMASDL2R2
C1320	CHIP CERAMIC CAP.(1608) B K 0.01μF/50V	CHD1JK30B103
C1324	ELECTROLYTIC CAP. 470μF/10V M	CE1AMASDL471
C1325	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1332	CHIP CERAMIC CAP.(1608) F Z 0.1μF/50V	CHD1JZ30F104
C1333	CHIP CERAMIC CAP.(1608) F Z 0.1μF/50V	CHD1JZ30F104
C1334	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1335	ELECTROLYTIC CAP. 100μF/16V M	CE1CMASDL101
C1348	ELECTROLYTIC CAP. 100μF/10V M	CE1AMASDL101
C1352	CERAMIC CAP.(AX) Y M 0.01μF/16V	CCA1CMT0Y103
C1552	MYLAR CAP. 0.22μF/50V J	CMA1JJS00224
C1553	ELECTROLYTIC CAP. 2.2μF/50V LL	CE1JMASLH2R2
C1555	ELECTROLYTIC CAP. 47μF/35V M	CE1GMASDL470
C1556	ELECTROLYTIC CAP. 1000μF/25V M	CE1EMZPDL102
C1558	CHIP CERAMIC CAP. F Z 0.01μF/50V	CHD1JZ30F103
C1559	ELECTROLYTIC CAP. 330μF/35V M	CE1GMASDL331
C1560	FILM CAP.(P) 0.01μF/50V J	CMA1JJS00103
C1571	P.P.CAP 0.27μF/200 J	CA2D274VC012
C1574⚠	ELECTROLYTIC CAP. 4.7μF/250V M	CE2EMASDL4R7
C1577	FILM CAP.(P) 0.022μF/50V J	CMA1JJS00223
C1578⚠	ELECTROLYTIC CAP. 47μF/35V M	CE1GMASDL470
C1580⚠	P.P. CAP 0.0082μF/1.6K J	CA3C822VC011
C1581⚠	CERAMIC CAP. BN 1200pF/2KV	CCD3DKA0B122

Ref. No.	Description	Part No.
C1584	ELECTROLYTIC CAP. 1μF/160V M	CE2CMASDL1R0
C1591	ELECTROLYTIC CAP. 10μF/50V M	CE1JMASDL100
C1592	ELECTROLYTIC CAP. 47μF/25V M	CE1EMASDL470
C1593	ELECTROLYTIC CAP. 4.7μF/50V M	CE1JMASDL4R7
C1594	ELECTROLYTIC CAP. 47μF/160V M W/F	CE2CMZNDL470
C1601⚠	METALIZED FILM CAP. 0.22μF/250V	CT2E224MS037
C1602⚠	METALIZED FILM CAP. 0.1μF/250V	CT2E104MS037
C1605⚠	CERAMIC CAP. 680pF/2KV	CA3D681PAN04
C1607⚠	SAFETY CAP. 4700pF/250V KX	CA2E472MR050
C1608	FILM CAP.(P) 0.0012μF/50V J	CMA1JJS00122
C1609⚠	FILM CAP.(P) 0.068μF/50V J	CMA1JJS00683
C1610⚠	ELECTROLYTIC CAP. 470μF/200V LX	CA2D471S6017
C1611⚠	FILM CAP.(P) 0.0015μF/50V J	CMA1JJS00152
C1612	FILM CAP.(P) 0.022μF/50V J	CMA1JJS00223
C1613	ELECTROLYTIC CAP. 4.7μF/50V M	CE1JMASDL4R7
C1615⚠	CERAMIC CAP. 680pF/2KV	CA3D681PAN04
C1616	ELECTROLYTIC CAP. 100μF/160V M	CE2CMZPDL101
C1617	ELECTROLYTIC CAP. 470μF/35V M	CE1GMZPDL471
C1619	ELECTROLYTIC CAP. 470μF/16V M	CE1CMASDL471
C1620	ELECTROLYTIC CAP. 47μF/25V M	CE1EMASDL470
C1621⚠	CERAMIC CAP. 1000pF/1KV	CCD3AKS0R102
C1625	ELECTROLYTIC CAP. 1000μF/10V M	CE1AMASDL102
C1626	ELECTROLYTIC CAP. 1μF/50V M	CE1JMASDL1R0
C1629	ELECTROLYTIC CAP. 0.47μF/50V M H7	CE1JMAVSLR47
C1630	CHIP CERAMIC CAP. B K 560pF/50V	CHD1JK30B561
C1639	ELECTROLYTIC CAP. 47μF/25V M	CE1EMASDL470
C1640	ELECTROLYTIC CAP. 1000μF/16V M	CE1CMZPDL102
C1641	CAP ALUMINUM ELECTOLYTIC 2200μF/6.3V M	CE0KMZNDL222
C1642	ELECTROLYTIC CAP. 1000μF/16V M	CE1CMZPDL102
C1644	CAP ALUMINUM ELECTOLYTIC 2200μF/6.3V M	CE0KMZNDL222
C1645	ELECTROLYTIC CAP. 100μF/6.3V M	CE0KMASDL101
C1646	ELECTROLYTIC CAP. 100μF/6.3V M	CE0KMASDL101
C1731	CHIP CERAMIC CAP.(1608) CH J 100pF/50V	CHD1JJ3CH101
C1732	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1735	ELECTROLYTIC CAP. 47μF/25V M H7	CE1EMAVSL470
C1738	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1801	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1802	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1803	ELECTROLYTIC CAP. 220μF/16V M	CE1CMASDL221
C1804	ELECTROLYTIC CAP. 220μF/16V M	CE1CMASDL221
C1805⚠	ELECTROLYTIC CAP. 470μF/16V M	CE1CMASDL471
C1806	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1807	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1808	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1809	CHIP CERAMIC CAP.(1608) B K 3300pF/50V	CHD1JK30B332
C1810	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1811	CHIP CERAMIC CAP.(1608) B K 3300pF/50V	CHD1JK30B332
C1812	ELECTROLYTIC CAP. 100μF/16V M	CE1CMASDL101
C1813	ELECTROLYTIC CAP. 4.7μF/50V M	CE1JMASDL4R7
C1814	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1815	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1816	CHIP CERAMIC CAP. B K 2200pF/50V	CHD1JK30B222
C1817	CHIP CERAMIC CAP. B K 2200pF/50V	CHD1JK30B222
C1818	CHIP CERAMIC CAP.(1608) B K 3300pF/50V	CHD1JK30B332
C1819	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1823	CHIP CERAMIC CAP. B K 3900pF/50V	CHD1JK30B392
C1824	CHIP CERAMIC CAP. F Z 1μF/10V	CHD1AZ30F105
C1825	ELECTROLYTIC CAP. 100μF/10V M H7	CE1AMAVSL101
CONNECTORS		
CN601A	TERMINAL PRINTBORD PIN MS-PIN155155	JTEA001CHY01
CN601B	TERMINAL PRINTBORD PIN MS-PIN155155	JTEA001CHY01

Ref. No.	Description	Part No.
CN1571⚠	CONNECTOR 5P(PB FREE) 200322305W8	J303C05TG001
CN1801	242 SERIES CONNECTOR 224202104W1	J322C04TG001
CN1802	242 SERIES CONNECTOR 224202104W1	J322C04TG001
DIODES		
D1001	PCB JUMPER D0.6-P5.0	JW5.0T
D1031	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1210	ZENER DIODE MTZJT-774.3A	QDTA0MTZJ4R3
D1302	ZENER DIODE MTZJT-779.1C	QDTC0MTZJ9R1
D1303	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1307	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1309	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1319	ZENER DIODE MTZJT-775.1B	QDTB0MTZJ5R1
D1552	SCHOTTKY BARRIER DIODE SB140	NDWZ000SB140
D1571	RECTIFIER DIODE FR202-B/P	NDQZ000FR202
D1572⚠	DIODE FR104-B	NDLZ000FR104
D1584	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1590⚠	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1591⚠	ZENER DIODE MTZJT-7736B	QDTB00MTZJ36
D1595⚠	ZENER DIODE MTZJT-7720C	QDTC00MTZJ20
D1596	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1597⚠	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1598⚠	DIODE FR104-B	NDLZ000FR104
D1603⚠	DIODE 1N5399-B/P	NDLZ001N5399
D1604⚠	DIODE 1N5399-B/P	NDLZ001N5399
D1605⚠	DIODE 1N5399-B/P	NDLZ001N5399
D1606⚠	DIODE 1N5399-B/P	NDLZ001N5399
D1607⚠	ZENER DIODE MTZJT-7724C	QDTC00MTZJ24
D1609	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1610	ZENER DIODE MTZJT-775.6B	QDTB0MTZJ5R6
D1613	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1614⚠	ZENER DIODE MTZJT-7739B	QDTB00MTZJ39
D1617⚠	SCHOTTKY BARRIER DIODE SB160	NDQZ000SB160
D1618⚠	RECOVERY DIODE ERC18-04	QDZZ0ERC1804
D1619	DIODE FR104-B	NDLZ000FR104
D1620⚠	ZENER DIODE MTZJT-777.5B	QDTB0MTZJ7R5
D1621	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1623⚠	DIODE FR154	NDLZ000FR154
D1624	ZENER DIODE MTZJT-7715B	QDTB00MTZJ15
D1625	RECTIFIER DIODE FR202-B/P	NDQZ000FR202
D1626	ZENER DIODE MTZJT-7736A	QDTA00MTZJ36
D1627⚠	SCHOTTKY BARRIER DIODE SB140	NDWZ000SB140
D1628	SCHOTTKY BARRIER DIODE SB240-B/P	NDQZ000SB240
D1629	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1630	DIODE FR154	NDLZ000FR154
D1632	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1633	ZENER DIODE MTZJT-7713B	QDTB00MTZJ13
D1634	PCB JUMPER D0.6-P5.0	JW5.0T
D1639	RECTIFIER DIODE 1N4005	NDQZ001N4005
D1640⚠	DIODE 1ZC36(Q)	QDLZ001ZC36Q
D1643	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1644	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1645	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1646	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1647	ZENER DIODE MTZJT-775.6C	QDTC0MTZJ5R6
D1648	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1649	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1652	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1653	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1731	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1732	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1801	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
D1804⚠	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133

Ref. No.	Description	Part No.
	ICS	
IC1001	IC VIF/SIF M61113FP TF0G	QSZBA0SHT035
IC1002	EEP-ROM 128K M24128-BWMN6TP	NSZBA0TSS268
IC1201⚠	IC MICRO COMPUTER/VCD R2J10180GF-A14FP 80P	QSZAA0RHT147
IC1551	VERTICAL OUTPUT IC LA78040A	QSBBA0SSY003
IC1601⚠	PHOTOCOUPLER LTV-817C-F	NPEC0LTV817F
IC1602	VOLTAGE REGULATOR PQ070XF01SZH	QSZBA0SSH054
IC1603	IC SHUNT REGULATOR KIA431-AT/P	NSZBA0TJY036
IC1605	IC SHUNT REGULATOR KIA431-AT/P	NSZBA0TJY036
IC1801	IC AUDIO SA7412	NSZBA0SQ0007
IC1802	IC SWITCHING TC4052BF(ELNF)	QSZBA0TTS162
	COILS	
L1001	PCB JUMPER D0.6-P5.0	JW5.0T
L1002	PCB JUMPER D0.6-P5.0	JW5.0T
L1005	PCB JUMPER D0.6-P5.0	JW5.0T
L1031	PCB JUMPER D0.6-P5.0	JW5.0T
L1033	INDUCTOR 18μH-J-26T	LLAXJATTU180
L1041	PCB JUMPER D0.6-P5.0	JW5.0T
L1043	PCB JUMPER D0.6-P5.0	JW5.0T
L1301	PCB JUMPER D0.6-P5.0	JW5.0T
L1302	PCB JUMPER D0.6-P5.0	JW5.0T
L1557	CHOKE COIL 22μH-K	LLBD00PKV021
L1601⚠	LINE FILTER JLB20102	LLEG0Z0XB006
L1603	CHOKE COIL 47μH	LLBD00PKV022
L1732	PCB JUMPER D0.6-P5.0	JW5.0T
	TRANSISTORS	
Q1001	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1002	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1210	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1285	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1301	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1303	TRANSISTOR 2SC2120-O(TE2 F T)	QQS02SC2120F
Q1304	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1571⚠	TRANSISTOR 2SC5885000RF	QQZZ02SC5885
Q1572⚠	NPN TRANSISTOR 2SC1627-Y (TE2.F.T)	QQSY2SC1627F
Q1601⚠	MOS FET 2SK3563	QFWZ02SK3563
Q1602⚠	TRANSISTOR 2SC2120-O(TE2 F T)	QQS02SC2120F
Q1604⚠	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1605	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1606	TRANSISTOR 2SA950-O (TE2 F T)	QQS002SA950F
Q1607	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1608	TRANSISTOR KTA1281Y-AT/P	NQVYKTA1281P
Q1609	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1610	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1611	TRANSISTOR 2SC2120-O(TE2 F T)	QQS02SC2120F
Q1612	TRANSISTOR 2SC2120-O(TE2 F T)	QQS02SC2120F
Q1613⚠	TRANSISTOR 2SC2120-O(TE2 F T)	QQS02SC2120F
Q1614⚠	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1616	TRANSISTOR 2SC2120-O(TE2 F T)	QQS02SC2120F
Q1617	TRANSISTOR 2SA950-O (TE2 F T)	QQS002SA950F
Q1618⚠	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1731	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1732	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1801	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q1802	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
	RESISTORS	
R1001	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101
R1002	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101
R1003	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R1004	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R1005	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R1006	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000

Ref. No.	Description	Part No.
R1007	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R1010	CHIP RES. 1/10W J 200 Ω	RRXAJR5Z0201
R1011	CARBON RES. 1/4W J 47 Ω	RCX4JATZ0470
R1012	CHIP RES. 1/10W J 150 Ω	RRXAJR5Z0151
R1013	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R1016	CARBON RES. 1/4W J 330 Ω	RCX4JATZ0331
R1018	CHIP RES. 1/10W J 220k Ω	RRXAJR5Z0224
R1019	CHIP RES. 1/10W J 220k Ω	RRXAJR5Z0224
R1022	CHIP RES. 1/10W J 2.2k Ω	RRXAJR5Z0222
R1023	CHIP RES. 1/10W J 56k Ω	RRXAJR5Z0563
R1024	CHIP RES. 1/10W J 22k Ω	RRXAJR5Z0223
R1025	CHIP RES. 1/10W J 56k Ω	RRXAJR5Z0563
R1026	CHIP RES. 1/10W J 22k Ω	RRXAJR5Z0223
R1027	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101
R1028	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101
R1030	CHIP RES. 1/10W J 12k Ω	RRXAJR5Z0123
R1031	CHIP RES. 1/10W J 27k Ω	RRXAJR5Z0273
R1035	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1036	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1037	CHIP RES. 1/10W J 180 Ω	RRXAJR5Z0181
R1041	CHIP RES. 1/10W J 91k Ω	RRXAJR5Z0913
R1164	METAL RESISTER. 2W J 0.56 Ω	RN02R56ZU001
R1201	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R1202	CHIP RES. 1/10W J 2.2k Ω	RRXAJR5Z0222
R1203	CHIP RES. 1/10W J 2.2k Ω	RRXAJR5Z0222
R1204	CHIP RES. 1/10W J 2.7k Ω	RRXAJR5Z0272
R1205	CHIP RES. 1/10W J 4.7k Ω	RRXAJR5Z0472
R1206	CHIP RES. 1/10W J 6.8k Ω	RRXAJR5Z0682
R1207	CHIP RES. 1/10W J 15k Ω	RRXAJR5Z0153
R1210	CHIP RES. 1/10W J 270 Ω	RRXAJR5Z0271
R1211	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R1212	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R1213	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R1214	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R1216	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R1217	CHIP RES. 1/10W J 100k Ω	RRXAJR5Z0104
R1218	CHIP RES. 1/10W J 22k Ω	RRXAJR5Z0223
R1219	CHIP RES. 1/10W J 22k Ω	RRXAJR5Z0223
R1222	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R1223	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R1224	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1225	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R1226	CHIP RES. 1/10W J 4.7k Ω	RRXAJR5Z0472
R1227	CHIP RES. 1/10W J 4.7k Ω	RRXAJR5Z0472
R1229	CHIP RES. 1/10W J 4.7k Ω	RRXAJR5Z0472
R1230	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1232	CHIP RES. 1/10W J 2.7k Ω	RRXAJR5Z0272
R1233	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101
R1234	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101
R1235	CARBON RES. 1/4W J 6.8k Ω	RCX4JATZ0682
R1236	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R1237	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1240	CHIP RES. 1/10W J 1M Ω	RRXAJR5Z0105
R1241	CHIP RES. 1/10W J 470 Ω	RRXAJR5Z0471
R1242	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R1243	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R1244	CHIP RES. 1/10W J 220k Ω	RRXAJR5Z0224
R1293	CHIP RES. 1/10W J 33k Ω	RRXAJR5Z0333
R1294	CHIP RES. 1/10W J 56k Ω	RRXAJR5Z0563
R1295	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1301	CHIP RES. 1/10W J 180k Ω	RRXAJR5Z0184
R1302	CHIP RES. 1/10W J 15k Ω	RRXAJR5Z0153
R1303	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103

Ref. No.	Description	Part No.
R1304	CHIP RES. 1/10W J 470 Ω	RRXAJR5Z0471
R1305	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1306	CHIP RES. 1/10W J 5.6k Ω	RRXAJR5Z0562
R1308	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R1309	CHIP RES. 1/10W J 39k Ω	RRXAJR5Z0393
R1311	CHIP RES. 1/10W J 10M Ω	RRXAJR5Z0106
R1312	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101
R1317	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R1320	CHIP RES. 1/10W J 120k Ω	RRXAJR5Z0124
R1321	CARBON RES. 1/4W J 82 Ω	RCX4JATZ0820
R1322	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101
R1323	CHIP RES. 1/10W J 6.8k Ω	RRXAJR5Z0682
R1327	PCB JUMPER D0.6-P5.0	JW5.0T
R1328	CARBON RES. 1/4W J 680 Ω	RCX4JATZ0681
R1330	CARBON RES. 1/4W J 680 Ω	RCX4JATZ0681
R1334	CHIP RES. 1/10W J 330 Ω	RRXAJR5Z0331
R1335	CHIP RES. 1/10W J 330 Ω	RRXAJR5Z0331
R1336	CHIP RES. 1/10W J 330 Ω	RRXAJR5Z0331
R1338	CARBON RES. 1/4W J 15 Ω	RCX4JATZ0150
R1339	PCB JUMPER D0.6-P5.0	JW5.0T
R1341	CHIP RES. 1/10W J 100k Ω	RRXAJR5Z0104
R1342	CHIP RES. 1/10W J 47k Ω	RRXAJR5Z0473
R1343	CHIP RES. 1/10W J 4.7k Ω	RRXAJR5Z0472
R1346	CHIP RES. 1/10W J 12k Ω	RRXAJR5Z0123
R1347	PCB JUMPER D0.6-P5.0	JW5.0T
R1430	CHIP RES. 1/10W J 750 Ω	RRXAJR5Z0751
R1544	CARBON RES. 1/4W J 100k Ω	RCX4JATZ0104
R1551	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R1552	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R1553	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R1556	CARBON RES. 1/4W J 1 Ω	RCX4JATZ01R0
R1558	CARBON RES. 1/4W J 12k Ω	RCX4JATZ0123
R1559	PCB JUMPER D0.6-P5.0	JW5.0T
R1560	CHIP RES. 1/10W J 2.7k Ω	RRXAJR5Z0272
R1561	CHIP RES. 1/10W J 3.9k Ω	RRXAJR5Z0392
R1562	CARBON RES. 1/4W J 6.8 Ω	RCX4JATZ06R8
R1563	CARBON RES. 1/4W J 6.8 Ω	RCX4JATZ06R8
R1564	PCB JUMPER D0.6-P5.0	JW5.0T
R1565⚠	CARBON RES. 1/4W J 2.7 Ω	RCX4JATZ02R7
R1566⚠	CARBON RES. 1/4W J 2.7 Ω	RCX4JATZ02R7
R1567⚠	CARBON RES. 1/4W J 2.7 Ω	RCX4JATZ02R7
R1568⚠	CARBON RES. 1/4W J 3.9 Ω	RCX4JATZ03R9
R1569⚠	CARBON RES. 1/4W J 3.9 Ω	RCX4JATZ03R9
R1571	CARBON RES. 1/4W J 180 Ω	RCX4JATZ0181
R1572	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R1573	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R1574	METAL OXIDE FILM RES. 2W J 1k Ω	RN02102ZU001
R1575	METAL OXIDE FILM RES. 2W J 1k Ω	RN02102ZU001
R1576⚠	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R1577	CARBON RES. 1/4W J 180 Ω	RCX4JATZ0181
R1578	CARBON RES. 1/2W J 82 Ω	RCX2JZQZ0820
R1579	CARBON RES. 1/4W J 33 Ω	RCX4JATZ0330
R1580	CARBON RES. 1/4W J 33 Ω	RCX4JATZ0330
R1581	CARBON RES. 1/4W J 39 Ω	RCX4JATZ0390
R1582	CARBON RES. 1/4W J 6.8 Ω	RCX4JATZ06R8
R1583⚠	METAL OXIDE FILM RES. 1W J 2.2 Ω	RN012R2ZU001
R1584	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R1586	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R1587	CARBON RES. 1/4W J 100k Ω	RCX4JATZ0104
R1588	CARBON RES. 1/4W J 100k Ω	RCX4JATZ0104
R1589	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R1590	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R1592	CARBON RES. 1/4W J 180k Ω	RCX4JATZ0184

Ref. No.	Description	Part No.
R1593	CARBON RES. 1/4W J 120k Ω	RCX4JATZ0124
R1594	CHIP RES. 1/10W J 68k Ω	RRXAJR5Z0683
R1595⚠	CHIP RES. 1/10W J 15k Ω	RRXAJR5Z0153
R1596	CHIP RES. 1/10W J 6.8k Ω	RRXAJR5Z0682
R1597	CHIP RES. 1/10W J 470 Ω	RRXAJR5Z0471
R1598⚠	CHIP RES. 1/10W J 22k Ω	RRXAJR5Z0223
R1599⚠	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1601⚠	CEMENT RES 5W K 1.2 Ω	RW051R2PG002
R1602	CARBON RES. 1/4W J 180 Ω	RCX4JATZ0181
R1603	CARBON RES. 1/4W J 180 Ω	RCX4JATZ0181
R1604⚠	CARBON RES. 1/4W J 820k Ω	RCX4JATZ0824
R1605⚠	CARBON RES. 1/4W J 820k Ω	RCX4JATZ0824
R1607⚠	CARBON RES. 1/4W J 680k Ω	RCX4JATZ0684
R1608	CARBON RES. 1/4W J 180k Ω	RCX4JATZ0184
R1610	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R1611⚠	METAL OXIDE FILM RES. 2W J 0.33 Ω	RN02R33ZU001
R1613	CARBON RES. 1/4W J 150 Ω	RCX4JATZ0151
R1614	CARBON RES. 1/4W J 1.2k Ω	RCX4JATZ0122
R1615	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R1616	PCB JUMPER D0.6-P5.0	JW5.0T
R1617	CARBON RES. 1/4W J 180 Ω	RCX4JATZ0181
R1618⚠	METAL OXIDE FILM RES. 2W J 8.2k Ω	RN02822ZU001
R1619⚠	CARBON RES. 1/4W J 8.2 Ω	RCX4JATZ08R2
R1620	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R1621	METAL OXIDE FILM RES. 2W J 15k Ω	RN02153ZU001
R1622	CARBON RES. 1/4W J 1.2k Ω	RCX4JATZ0122
R1623	CARBON RES. 1/4W J 1.2k Ω	RCX4JATZ0122
R1624	CARBON RES. 1/4W J 39k Ω	RCX4JATZ0393
R1625	CARBON RES. 1/4W J 43k Ω	RCX4JATZ0433
R1629	CARBON RES. 1/4W J 13k Ω	RCX4JATZ0133
R1630	CARBON RES. 1/4W J 13k Ω	RCX4JATZ0133
R1631	CARBON RES. 1/4W J 13k Ω	RCX4JATZ0133
R1632	CHIP RES. 1/10W J 1.2k Ω	RRXAJR5Z0122
R1633	CARBON RES. 1/4W J 5.6k Ω	RCX4JATZ0562
R1634	CHIP RES. 1/10W J 6.8k Ω	RRXAJR5Z0682
R1635	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1636	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1637	CARBON RES. 1/4W J 2.2 Ω	RCX4JATZ02R2
R1638	CARBON RES. 1/4W J 220 Ω	RCX4JATZ0221
R1639⚠	CARBON RES. 1/2W J 1.5k Ω	RCX2JZQZ0152
R1640	CHIP RES. 1/10W J 56k Ω	RRXAJR5Z0563
R1641	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1642	CHIP RES. 1/10W J 47k Ω	RRXAJR5Z0473
R1643	PCB JUMPER D0.6-P5.0	JW5.0T
R1644	CHIP RES. 1/10W J 39k Ω	RRXAJR5Z0393
R1645	CHIP RES. 1/10W J 56k Ω	RRXAJR5Z0563
R1646	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R1647	CARBON RES. 1/4W J 2.2 Ω	RCX4JATZ02R2
R1648	PCB JUMPER D0.6-P5.0	JW5.0T
R1649	CARBON RES. 1/4W J 2.2 Ω	RCX4JATZ02R2
R1650	PCB JUMPER D0.6-P5.0	JW5.0T
R1651	CHIP RES. 1/10W J 4.7k Ω	RRXAJR5Z0472
R1652	CARBON RES. 1/4W J 3.3 Ω	RCX4JATZ03R3
R1653	CARBON RES. 1/4W J 3.3 Ω	RCX4JATZ03R3
R1654	PCB JUMPER D0.6-P5.0	JW5.0T
R1655	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R1656	CHIP RES. 1/10W J 22k Ω	RRXAJR5Z0223
R1657	CHIP RES. 1/10W F 220 Ω	RRXAFR5H2200
R1658	CHIP RES. 1/10W F 22k Ω	RRXAFR5H2202
R1659	CARBON RES. 1/4W J 560 Ω	RCX4JATZ0561
R1660	CARBON RES. 1/4W J 2.2 Ω	RCX4JATZ02R2
R1662	PCB JUMPER D0.6-P5.0	JW5.0T
R1663	CHIP RES. 1/10W J 560 Ω	RRXAJR5Z0561

Ref. No.	Description	Part No.
R1664	CHIP RES. 1/10W J 3.3k Ω	RRXAJR5Z0332
R1665	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1666	PCB JUMPER D0.6-P5.0	JW5.0T
R1667	CHIP RES. 1/10W J 680 Ω	RRXAJR5Z0681
R1668	CHIP RES. 1/10W F 150 Ω	RRXAFR5H1500
R1669	CHIP RES. 1/10W F 4.7k Ω	RRXAFR5H4701
R1670	CHIP RES. 1/10W F 10k Ω	RRXAFR5H1002
R1674	CARBON RES. 1/4W J 390 Ω	RCX4JATZ0391
R1675	CARBON RES. 1/4W J 1 Ω	RCX4JATZ01R0
R1676	CHIP RES. 1/10W J 56k Ω	RRXAJR5Z0563
R1677	CARBON RES. 1/4W J 220 Ω	RCX4JATZ0221
R1678	CHIP RES. 1/10W J 47k Ω	RRXAJR5Z0473
R1679	CHIP RES. 1/10W J 6.8k Ω	RRXAJR5Z0682
R1680	METAL OXIDE FILM RES. 1W J 4.7 Ω	RN014R7ZU001
R1694	CHIP RES. 1/10W J 10 Ω	RRXAJR5Z0100
R1701	CHIP RES. 1/10W J 75 Ω	RRXAJR5Z0750
R1702	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1704	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R1730	CHIP RES. 1/10W J 22k Ω	RRXAJR5Z0223
R1734	CHIP RES. 1/10W J 470 Ω	RRXAJR5Z0471
R1735	CHIP RES. 1/10W J 75 Ω	RRXAJR5Z0750
R1736	CHIP RES. 1/10W J 820 Ω	RRXAJR5Z0821
R1801	CHIP RES. 1/10W J 4.7k Ω	RRXAJR5Z0472
R1802	CHIP RES. 1/10W J 3.9k Ω	RRXAJR5Z0392
R1803	CHIP RES. 1/10W J 4.7k Ω	RRXAJR5Z0472
R1804	CHIP RES. 1/10W J 3.9k Ω	RRXAJR5Z0392
R1807	CARBON RES. 1/4W J 4.7k Ω	RCX4JATZ0472
R1808	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R1809⚠	METAL OXIDE FILM RES. 1W J 2.7 Ω	RN012R7ZU001
R1810	CHIP RES. 1/10W J 2.2k Ω	RRXAJR5Z0222
R1811	CHIP RES. 1/10W J 2.2k Ω	RRXAJR5Z0222
R1812	CHIP RES. 1/10W J 4.7k Ω	RRXAJR5Z0472
R1813	CHIP RES. 1/10W J 4.7k Ω	RRXAJR5Z0472
R1816	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R1818	METAL OXIDE FILM RES. 1W J 2.7 Ω	RN012R7ZU001
R1821	CARBON RES. 1/4W J 180 Ω	RCX4JATZ0181
R1822	CARBON RES. 1/4W J 180 Ω	RCX4JATZ0181
R1823	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R1825	CHIP RES. 1/10W J 22k Ω	RRXAJR5Z0223
R1826	CHIP RES. 1/10W J 22k Ω	RRXAJR5Z0223
R1827	CHIP RES. 1/10W J 27k Ω	RRXAJR5Z0273
R1828	CHIP RES. 1/10W J 27k Ω	RRXAJR5Z0273
R1854	CHIP RES. 1/10W J 2k Ω	RRXAJR5Z0202
R1855	CHIP RES. 1/10W J 47k Ω	RRXAJR5Z0473
R1856	CHIP RES. 1/10W J 22k Ω	RRXAJR5Z0223
R1857	CHIP RES. 1/10W J 47k Ω	RRXAJR5Z0473
R1858	CHIP RES. 1/10W J 22k Ω	RRXAJR5Z0223
	SWITCHES	
SW1201	TACT SWITCH SKQSAB	SST0101AL038
SW1202	TACT SWITCH SKQSAB	SST0101AL038
SW1203	TACT SWITCH SKQSAB	SST0101AL038
SW1204	TACT SWITCH SKQSAB	SST0101AL038
SW1205	TACT SWITCH SKQSAB	SST0101AL038
SW1206	TACT SWITCH SKQSAB	SST0101AL038
SW1207	TACT SWITCH SKQSAB	SST0101AL038
	MISCELLANEOUS	
BC1001	BEADS INDUCTOR FBR07HA121SB-00	LLBF00STU030
BC1002	BEADS INDUCTOR FBR07HA121SB-00	LLBF00STU030
BC1004	BEADS INDUCTOR FBR07HA121SB-00	LLBF00STU030
BC1005	BEADS INDUCTOR FBR07HA121SB-00	LLBF00STU030
BC1006	CHIP INDUCTOR BK1608HM102-T	LLC102NTU018
BC1571	BEAD INDUCTOR FBA04HA600VB-00	LLBF00STU026

Ref. No.	Description	Part No.
BC1602	BEADS INDUCTOR FBR07HA121SB-00	LLBF00STU030
BC1611⚠	BEAD CORE B16 RH 3.5X3X1.3	XL03003XM002
CF1031	CERAMIC TRAP 4.5MHz	FBE455PMR003
CF1032	CERAMIC FILTER SFSRA4M50CF00-B0	FBB455PMR004
F1601⚠	FUSE STC4A125V U/CT	PAGE20CW3402
FH1601	FUSE HOLDER MSF-015 LF (B110)	XH01Z00LY002
FH1602	FUSE HOLDER MSF-015 LF (B110)	XH01Z00LY002
JK1701	RCA JACK(YELLOW) MTJ-032-05B-20(B110)	JXRL010LY135
JK1702	RCA JACK(RED) MTJ-032-05A-21(B110)	JYRL010LY029
JK1703	RCA JACK(WHITE) MTJ-032-05B-22(B110)	JXRL010LY136
JK1730	JACK RCA PCB L MSP-241V-05 NI LFW/O	JXRL010LY148
JK1801	MINIATURE JACK(PB FREE) CKX-035-318AZ4	JYSL010SNJ01
LD1001	WIRE 150/BLA/AWG26#1007	WX3001A6FF15
PS1601⚠	THERMISTOR ZPB45BL3R0A	QNBZ45BL3R0A
RS1201	SENSOR REMOTE RECEIVER KSM-602SR2S	USESJRSKK049
SA1601⚠	SURGE ABSORBER 470V+-10PER	NVQZ10D471KB
SF1002	FILTER CERAMIC BAND PASS SAFHS45M7VAMZ00B05	FBB456LMR005
SG1601⚠	GAP. FNR-G3.10D	FAZ000LD6005
T1571⚠	TRANS FBT JF0501-3201A-G	LTF00CPXB048
T1572	HORIZONTAL DRIVE TRANS LP2-005	LTH00CPA5005
T1601⚠	TRANS POWER 7704	LTT3PC0KT019
TB9	MODULE HEAT SINK PMC P7150UT	1EM423968
TB10	HEAT SINK PLE	1EM321328
TB11	HEAT SINK PME P7450UM	1EM423983
TL2	SCREW B-TIGHT D3X8 BIND HEAD+	GBJB3080
TP1301	PCB JUMPER D0.6-P22.0	JW22.0T
TP1302	PCB JUMPER D0.6-P21.5	JW21.5T
TP1304	PCB JUMPER D0.6-P5.0	JW5.0T
TP1305	PCB JUMPER D0.6-P5.0	JW5.0T
TP1306	PCB JUMPER D0.6-P5.0	JW5.0T
TP1307	PCB JUMPER D0.6-P5.0	JW5.0T
TP1501	PCB JUMPER D0.6-P23.0	JW23.0T
TP1502	PCB JUMPER D0.6-P21.5	JW21.5T
TP1503	PCB JUMPER D0.6-P21.5	JW21.5T
TP1731	PCB JUMPER D0.6-P11.0	JW11.0T
TU1001	TUNER UNIT ENV56M07D8F	UTUNATSMS001
WT1	LEAD CLAMPER	1790256
W1601⚠	AC CORD PB8K9F9110A-055	WAC0162LW003
VR1061	CARBON P.O.T. VZ067TL1 B203 PB(F)	VRCB203HH014
X1301	XTAL 3.579545 MHz	FXD355LLN003

SUB CBA

Ref. No.	Description	Part No.
	SUB CBA Consists of the following:	---------
	CAPACITORS	
C9634	ELECTROLYTIC CAP. 470µF/10V M	CE1AMASDL471
C9635	ELECTROLYTIC CAP. 1000µF/6.3V M	CE0KMASDL102
C9637	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C9662	ELECTROLYTIC CAP. 470µF/16V M	CE1CMASDL471
C9664	ELECTROLYTIC CAP. 220µF/6.3V M	CE0KMASDL221
C9670	ELECTROLYTIC CAP. 470µF/10V M	CE1AMASDL471
	DIODES	
D9637	ZENER DIODE MTZJT-773.9A	QDTA0MTZJ3R9
D9639	SWITCHING DIODE 1SS133(T-77)	QDTZ001SS133
	ICS	
IC9602	VOLTAGE REGULATOR TLV1117IDCYRG3	NSZBA0TTY219
IC9603	IC SHUNT REGULATOR KIA431-AT/P	NSZBA0TJY036
	COIL	
L9615	INDUCTOR 10µH-K-5FT	LLARKBSTU100

Ref. No.	Description	Part No.
	TRANSISTORS	
Q9615	TRANSISTOR 2SC2120-O(TE2 F T)	QQS02SC2120F
Q9619	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
	RESISTORS	
R9609	CARBON RES. 1/4W J 150 Ω	RCX4JATZ0151
R9610	CARBON RES. 1/4W J 1.5 Ω	RCX4JATZ01R5
R9611	PCB JUMPER D0.6-P5.0	JW5.0T
R9613	CARBON RES. 1/2W J 3.3 Ω	RCX2JZQZ03R3
R9614	RES CHIP.(1608) 1/10W J 0.30 Ω	RRXAR30HH007
R9615	RES CHIP.(1608) 1/10W J 0.30 Ω	RRXAR30HH007
R9652	CHIP RES. 1/10W J 220 Ω	RRXAJR5Z0221
R9655	CARBON RES. 1/4W J 1.2 Ω	RCX4JATZ01R2
R9658	CARBON RES. 1/4W J 1.5 Ω	RCX4JATZ01R5
R9671	CARBON RES. 1/4W J 330 Ω	RCX4JATZ0331
R9681	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R9687	CHIP RES. 1/10W F 5.6k Ω	RRXAFR5H5601
R9688	CHIP RES. 1/10W F 15k Ω	RRXAFR5H1502
R9695	CARBON RES. 1/4W J 390 Ω	RCX4JATZ0391
R9747	PCB JUMPER D0.6-P5.0	JW5.0T
R9748	PCB JUMPER D0.6-P5.0	JW5.0T
R9788	CHIP RES. 1/10W J 130 Ω	RRXAJR5Z0131
R9789	CHIP RES. 1/10W J 130 Ω	RRXAJR5Z0131
R9790	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101
R9791	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101

CRT CBA

Ref. No.	Description	Part No.
	CRT CBA Consists of the following:	----------
	CAPACITORS	
C2501⚠	CERAMIC CAP. B K 1000pF/2KV	CCD3DKP0B102
C2511	CERAMIC CAP.(AX) B K 330pF/50V	CCA1JKT0B331
C2521	CERAMIC CAP.(AX) B K 330pF/50V	CCA1JKT0B331
C2531	CERAMIC CAP.(AX) B K 390pF/50V	CCA1JKT0B391
	COIL	
L2501	INDUCTOR 180µH-J-5FT	LLARJCSTU181
	TRANSISTORS	
Q2511	NPN TRANSISTOR 2SC2482(T6FUNAIF M	QRSZ2SC2482F
Q2521	NPN TRANSISTOR 2SC2482(T6FUNAIF M	QRSZ2SC2482F
Q2531	NPN TRANSISTOR 2SC2482(T6FUNAIF M	QRSZ2SC2482F
	RESISTORS	
R2510⚠	METAL OXIDE FILM RES. 1W J 15k Ω	RN01153ZU001
R2511	CHIP RES. 1/10W J 33 Ω	RRXAJR5Z0330
R2512	CARBON RES. 1/4W J 5.6k Ω	RCX4JATZ0562
R2515	CHIP RES. 1/10W J 560 Ω	RRXAJR5Z0561
R2516A	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R2517	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R2520⚠	METAL OXIDE FILM RES. 1W J 15k Ω	RN01153ZU001
R2521	CHIP RES. 1/10W J 33 Ω	RRXAJR5Z0330
R2522	CARBON RES. 1/4W J 5.6k Ω	RCX4JATZ0562
R2525	CHIP RES. 1/10W J 560 Ω	RRXAJR5Z0561
R2526A	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R2527	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R2530⚠	METAL OXIDE FILM RES. 1W J 15k Ω	RN01153ZU001
R2531	CHIP RES. 1/10W J 33 Ω	RRXAJR5Z0330
R2532	CARBON RES. 1/4W J 5.6k Ω	RCX4JATZ0562
R2535	CHIP RES. 1/10W J 560 Ω	RRXAJR5Z0561
R2536	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R2537	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
	MISCELLANEOUS	
CL2501	WIRE ASSEMBLY 8P 300MM	WX1T9200-003
JK2501⚠	CRT SOCKET ISMP02S	JSCC220PK009

JUNCTION-A CBA

Ref. No.	Description	Part No.
	JUNCTION-A CBA Consists of the following:	----------
	CONNECTOR	
CN2801	242 SERIES CONNECTOR TUC-P04X-B1 WHT ST	JCTUB04TG002
	MISCELLANEOUS	
CL2801	WIRE ASSEMBLY 2P 180MM	WX1T9200-005

JUNCTION-B CBA

Ref. No.	Description	Part No.
	JUNCTION-B CBA Consists of the following:	----------
	CONNECTOR	
CN2802	242 SERIES CONNECTOR TUC-P04X-B1 WHT ST	JCTUB04TG002
	MISCELLANEOUS	
CL2802	WIRE ASSEMBLY 2P 180MM	WX1T9200-005

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